

SHARP SERVICE MANUAL

SX802R21ATPKK

COMMERCIAL MICROWAVE OVEN



MODEL **R-21AT**

In interests of user-safety the oven should be restored to its original condition and only parts identical to those specified should be used.

TABLE OF CONTENTS

	Page
SERVICING	INSIDE FRONT COVER
CAUTION, MICROWAVE RADIATION	1
WARNING	1
PRODUCT SPECIFICATIONS	2
GENERAL INFORMATION	2
APPEARANCE VIEW	3
OPERATION SEQUENCE	4
FUNCTION OF IMPORTANT COMPONENTS	5
TROUBLESHOOTING GUIDE	6
TEST PROCEDURE	7
TOUCH CONTROL PANEL ASSEMBLY	13
COMPONENT REPLACEMENT AND ADJUSTMENT PROCEDURE	20
MICROWAVE MEASUREMENT	25
WIRING DIAGRAM	26
PICTORIAL DIAGRAM	27
CONTROL PANEL CIRCUIT	28
PRINTED WIRING BOARD	29
PARTS LIST	30

SHARP CORPORATION

SERVICING

WARNING TO SERVICE PERSONNEL

Microwave ovens contain circuitry capable of producing very high voltage and current. Contact with following parts will result in electrocution.

High voltage capacitor, High voltage transformer, Magnetron, High voltage rectifier, High voltage fuse, High voltage harness.

REMEMBER TO CHECK 3D

- 1) Disconnect the supply.
- 2) Door opened, and wedged open.
- 3) Discharge high voltage capacitor.

WARNING: AGAINST THE CHARGE OF THE HIGH-VOLTAGE CAPACITOR.

The high-voltage capacitor remains charged about 60 seconds after the oven has been switched off. Wait for 60 seconds and then short-circuit the connection of the high-voltage capacitor (that is, of the connecting lead of the high-voltage rectifier) against the chassis using a screwdriver with an insulated handle.

Sharp recommend that wherever possible fault-finding is carried out with the supply disconnected. In some cases, it may be necessary to connect the supply with the cover removed to carry out fault investigation in the circuitry. In such cases, the high voltage circuit should be disabled as described below to reduce the hazards:-

- Carry out 3D checks (see above)
- Disconnect the supply leads from the high voltage transformer, making a note of the polarity. Insulate the connectors, ensuring they are positioned away from the transformer and fastened there.
- Connect any relevant test equipment e.g. voltmeter.
- Reconnect the oven to the supply, then close the door.
- Note the results of the test, taking care to keep clear of the operational oven.
- Carry out 3D checks (see above).
- Reconnect the leads to the transformer. Take care to observe correct polarity.
- Carry out 4R checks (see below).

Microwave ovens should not be used without load. To test for the presence of microwave energy within a cavity, place a cup of cold water on the ceramic shelf, close the door and set the microwave timer for one (1) minute, set the power level to HIGH (100%) and push the start key. When the one (1) minute has elapsed (timer at zero) carefully check that the water is now hot.

AFTER REPAIR REMEMBER TO CHECK 4R

- 1) Reconnect all leads removed from components during testing.
- 2) Replace the outer case (cabinet).
- 3) Reconnect the supply.
- 4) Run the oven. Check all functions.

When all service work is completed and the oven is fully assembled, the microwave power output should be checked and microwave leakage test should be carried out.

IMPORTANT: If the oven becomes inoperative because of a blown fuse M10A Fuse, check the monitored 1st. interlock switch and monitor switch before replacing the fuse M10A.

WARNING: WIRING / RE-WIRING

Before carrying out any work; carry out 3D checks.

- 1) Disconnect the power supply.
- 2) Open the door and wedge open.
- 3) Discharge the high voltage capacitor.

RE-WIRING

- 1) Wires must not touch:
 - a) High voltage parts:
 - b) Parts that become hot.
 - c) Sharp edges
 - d) Movable parts
- 2) Positive lock connectors are fitted correctly.
- 3) Wires are connected correctly as per pictorial diagram.
- 4) Now wire leads are trapped by the outer wrap.

SERVICE MANUAL

SHARP

COMMERCIAL
MICROWAVE OVEN

R-21AT

GENERAL IMPORTANT INFORMATION

This Manual has been prepared to provide Sharp Corp. Service engineers with Operation and Service Information.

It is recommended that service engineers carefully study the entire text of this manual, so they will be qualified to render satisfactory customer service.

CAUTION MICROWAVE RADIATION

Service engineers should not be exposed to the microwave energy which may radiate from the magnetron or other microwave generating devices if it is improperly used or connected. All input and output microwave connections, waveguides, flanges and gaskets must be secured. Never operate the device without a microwave energy absorbing load attached. Never look into an open waveguide or antenna while the device is energized.

WARNING

Never operate the oven until the following points are ensured.

- (A) The door is tightly closed.
- (B) The door brackets and hinges are not defective.
- (C) The door packing is not damaged.
- (D) The door is not deformed or warped.
- (E) There is not any other visible damage with the oven.

Servicing and repair work must be carried out only by trained service engineers.

All the parts marked "*" on parts list are used at voltages more than 250V.

Removal of the outer wrap gives access to potentials above 250V.

All the parts marked "Δ" on parts list may cause undue microwave exposure, by themselves, or when they are damaged, loosened or removed.

PRODUCT SPECIFICATIONS

GENERAL INFORMATION

APPEARANCE VIEW

OPERATING SEQUENCE

FUNCTION OF IMPORTANT
COMPONENTS

SERVICING AND
TROUBLESHOOTING GUIDE

TEST PROCEDURE

TOUCH CONTROL PANEL

COMPONENT REPLACEMENT
AND ADJUSTMENT PROCEDURE

MICROWAVE MEASUREMENT

WIRING DIAGRAM

PARTS LIST

SHARP CORPORATION
OSAKA, JAPAN

PRODUCT DESCRIPTION

SPECIFICATION

ITEM	DESCRIPTION
Power Requirements	230 - 240 Volts 50 Hertz Single phase, 3 wire earthed
Power Output	1000 W nominal of RF microwave energy (measured by method of IEC 705) Operating frequency 2450 MHz
Case Dimensions	Width 520 mm Height 309 mm including foot Depth 406 mm
Cooking Cavity Dimensions	Width 351 mm Height 211 mm Depth 372 mm
Control Complement	Touch Control System Timer (0 - 99 minutes and 99 seconds) Microwave Power for Variable Cooking Repetition Rate; P-HI Full power throughout the cooking time P-90 approx. 90% of Full Power P-80 approx. 80% of Full Power P-70 approx. 70% of Full Power P-60 approx. 60% of Full Power P-50 approx. 50% of Full Power P-40 approx. 40% of Full Power P-30 approx. 30% of Full Power P-20 approx. 20% of Full Power P-10 approx. 10% of Full Power P-0 No power throughout the cooking time DOUBLE QUANTITY pad EXPRESS DEFROST pad Number pads SELECT TIME pad STOP/CLEAR pad SELECT POWER pad START pad SET pad CHECK pad SIGNAL pad
Set Weight	Approx. 18 kg

GENERAL INFORMATION

WARNING

THIS APPLIANCE MUST BE EARTHED

IMPORTANT

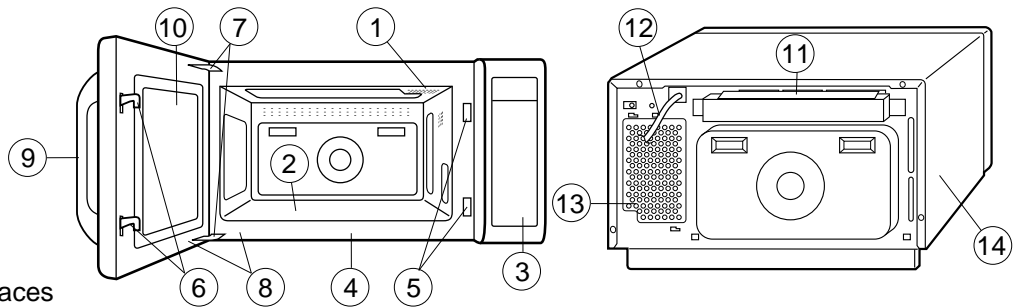
THE WIRES IN THIS MAINS LEAD ARE COLOURED IN ACCORDANCE WITH THE FOLLOWING CODE:

GREEN-AND-YELLOW	: EARTH
BLUE	: NEUTRAL
BROWN	: LIVE

APPEARANCE VIEW

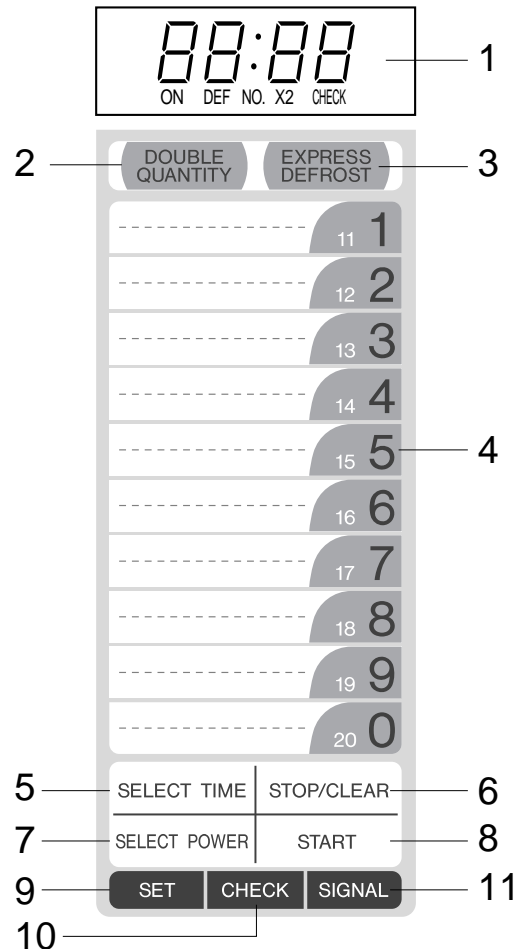
OVEN

1. Oven light
2. Ceramic shelf
3. Control panel
4. Cavity face plate
5. Door latch openings
6. Door latches
7. Door hinges
8. Door seals and sealing surfaces
9. Door handle
10. Oven door with see-through window
11. Air ventilation cover and openings
12. Power supply cord
13. Air intake openings
14. Outer case cabinet



TOUCH CONTROL PANEL

1. Digital Readout
2. DOUBLE QUANTITY pad
3. EXPRESS DEFROST pad
4. Number pads for time and memory programming
5. SELECT TIME pad
6. STOP/CLEAR pad; touch to stop operation of oven and clear remaining heating time
7. SELECAT POWER pad for setting variable power level
8. START pad; touch to operate oven after door is closed and time is set
9. SET pad for setting memory
10. CHECK pad for checking memory
11. SIGNAL pad for setting signal sound



OPERATION SEQUENCE

OFF CONDITION

Closing the door activates the 1st. latch switch, 2nd. latch switch and stop switch.

IMPORTANT:

When the oven door is closed, the contacts COM-NC of the monitor switch must be open. When the microwave oven is plugged in a wall outlet (230 - 240V 50Hz), the line voltage is supplied to the noise filter and the control unit.

Figure O-1 on page 26

1. The oven display will show .

MICROWAVE COOKING CONDITION

Program desired cooking time by touching SELECT TIME pad and the NUMBER pads. When the START pad is touched, the following operations occur:

Figure O-2 on page 26

RELAY	CONNECTED COMPONENTS
RY-2	power transformer
RY-3	oven lamp/antenna motor/fan motor

1. The line voltage is supplied to the primary winding of the high voltage transformer. The voltage is converted to about 3.3 volts A.C. output on the filament winding and high voltage of approximately 2300 volts A.C. on the secondary winding.
2. The filament winding voltage (3.3 volts) heats the magnetron filament and the high voltage (2000 volts) is sent to the voltage doubling circuit, where it is doubled to negative voltage of approximately 4000 volts D.C..
3. The 2450 MHz microwave energy produced in the magnetron generates a wave length of 12.24 cm. This energy is channelled through the waveguide (transport channel) into the oven cavity, where the food is placed to be cooked.
4. When the cooking time is up, a signal tone is heard and the relays RY2 + RY3 go back to their home position. The circuits to the oven lamp, high voltage transformer, fan motor and antenna motor are cut off.
5. When the oven door is opened during a cooking cycle, the switches come to the following condition.

Switch	Contact	Condition	
		During Cooking	Oven Door Open (No cooking)
1st. interlock switch	COM-NO	Closed	Opened
Latch switch	COM-NO	Closed	Opened
2nd. interlock relay control switch	COM-NO	Closed	Opened
Monitor Switch	COM-NC	Opened	Closed

The circuit to the high voltage transformer, fan motor, oven lamp and antenna motor are cut off when the 1st. interlock switch, latch switch and 2nd. interlock relay control switch are made open. Shown in the display is remaining time.

6. MONITOR SWITCH CIRCUIT

The monitor switch is mechanically controlled by the oven door, and monitors the operation of the 1st. interlock switch.

- 6-1. When the oven door is opened during or after the cycle of a cooking program, the 1st. interlock switch, latch switch and 2nd. interlock relay control switch must open their contacts first. After that the contacts (COM-NC) of the monitor switch can be closed.
- 6-2. When the oven door is closed, the contacts (COM-NC) of the monitor switch must be opened. After that the contacts of the 1st. interlock switch, latch switch and 2nd. interlock relay control switch are closed.
- 6-3. When the oven door is opened and the contacts of the 1st. latch switch, 2nd. latch switch and the relay RY2 remain closed, the fuse M10A will blow, because the monitor switch is closed and a short circuit is caused.

POWER LEVEL P-0 TO P-90 COOKING

When Variable Cooking Power is programmed, the line voltage is supplied to the power transformer intermittently through the contacts of relay (RY-2) which is operated by the control unit within a 32 second time base. Microwave power operation is as follows:

VARI-MODE	ON TIME	OFF TIME
Power 10(P-HI) (100% power)	32 sec.	0 sec.
Power 9(P-90) (approx. 90% power)	30 sec.	2 sec.
Power 8(P-80) (approx. 80% power)	26 sec.	6 sec.
Power 7(P-70) (approx. 70% power)	24 sec.	8 sec.
Power 6(P-60) (approx. 60% power)	22 sec.	10 sec.
Power 5(P-50) (approx. 50% power)	18 sec.	14 sec.
Power 4(P-40) (approx. 40% power)	16 sec.	16 sec.
Power 3(P-30) (approx. 30% power)	12 sec.	20 sec.
Power 2(P-20) (approx. 20% power)	8 sec.	24 sec.
Power 1(P-10) (approx. 10% power)	6 sec.	26 sec.
Power 0(P-0) (0% power)	0 sec.	32 sec.

Note: The ON/OFF time ratio does not correspond with the percentage of microwave power, because approx. 2 seconds are needed for heating of the magnetron filament.

FUNCTION OF IMPORTANT COMPONENTS

DOOR OPEN MECHANISM

The door is opened by grasping the door handle, refer to Figure D-1.

When the door handle is grasped, the handle lever is pulled. And then the upper and lower latch heads are moved upward by the handle lever, and they are released from the latch hook. Now the door will open.

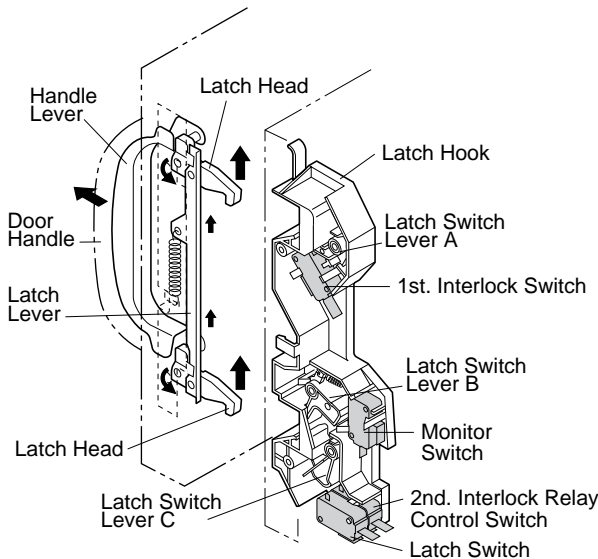


Figure D-1. Door Open Mechanism

1ST. INTERLOCK SWITCH, LATCH SWITCH AND 2ND. INTERLOCK RELAY CONTROL SWITCH

1. When the oven door is closed, the contacts (COM-NO) of each switch must be closed.
2. When the oven door is opened, the contacts (COM-NO) of each switch must be opened.

MONITOR SWITCH

1. When the door is closed, the contacts (COM-NC) must be opened.
2. When the door is opened, the contacts (COM-NC) must be closed.
3. If the oven door is opened and the contacts (COM-NO) of the 1st. interlock switch fail to open, the fuse M10A blows immediately after closing the contacts (COM-NC) of the monitor switch.

CAUTION: BEFORE REPLACING A BLOWN FUSE M10A TEST THE 1ST. INTERLOCK SWITCH, MONITOR SWITCH AND MONITOR RESISTOR FOR PROPER OPERATION. (REFER TO CHAPTER "TEST PROCEDURE").

FUSE M10A 250V

1. If the wire harness or electrical components are short-circuited, this fuse blows to prevent an electric shock or fire hazard.
2. This fuse blows when the 1st. interlock switch remain closed with the oven door open and when the contacts (COM-NC) of monitor switch closes.

HIGH VOLTAGE FUSE 0.75A

The high voltage fuse blows when the high voltage rectifier or the magnetron is shorted.

THERMAL CUT-OUT 145°C (MAGNETRON)

This thermal cut-out protects the magnetron against over-heating. If the temperature goes up higher than 145°C because the fan motor is interrupted or the ventilation openings are blocked, the thermal cut-out will open and line voltages to the high voltage transformer will be cut off and the operation of the magnetron will be stopped. The thermal cut-out will not resume.

THERMAL CUT-OUT 125°C (OVEN)

The thermal cut-out located on the top of the oven cavity is designed to prevent damage to the oven if the food in the oven catches fire due to over heating produced by improper setting of the cooking time or failure of control unit. Under normal operation, the oven thermal cut-out remains closed. However, when abnormally high temperatures are reached within the oven cavity, the oven thermal cut-out will open at 125°C causing the oven to shut down. The thermal cut-out will not resume.

MONITOR RESISTOR

The monitor resistor prevents the fuse M10A bursting when the fuse M10A blows due to the operation of the monitor switch.

NOISE FILTER

The noise filter assembly prevents radio frequency interference that might flow back in the power circuit.

ANTENNA MOTOR

The antenna motor rotates the stirrer antenna located on the bottom of the oven cavity, so that the food on the ceramic shelf is cooked evenly during cooking. The antenna motor may turn in either direction.

COOLING FAN MOTOR

The cooling fan motor drives a blade which draws external cool air. This cool air is directed through the air vanes surrounding the magnetron and cools the magnetron. This air is channelled through the oven cavity to remove steam and vapors given off from the heating food. It is then exhausted through the exhausting air vents at the oven cavity.

TROUBLESHOOTING GUIDE

When troubleshooting the microwave oven, it is helpful to follow the Sequence of Operation in performing the checks. Many of the possible causes of trouble will require that a specific test be performed. These tests are given a procedure letter which will be found in the "Test Procedure" section.

TEST PROCEDURE		A	B	C	D	E	E	E	E	F	G	H	I	I	J	K	L	M	M	N	CK	RE	RE	RE	CK	CK	CK	CK
POSSIBLE CASE AND DEFECTIVE PARTS		MAGNETRON	HIGH VOLTAGE TRANSFORMER	H.V. RECTIFIER ASSEMBLY	HIGH VOLTAGE CAPACITOR	1ST. INTERLOCK SWITCH	LATCH SWITCH	2ND. INTERLOCK RELAY CONTROL SWITCH	MONITOR SWITCH	THERMAL CUT-OUT	FUSE M10A	NOISE FILTER	COOLING FAN MOTOR	ANTENNA MOTOR	HIGH VOLTAGE FUSE	TOUCH CONTROL PANEL	KEY UNIT	RELAY (RY2)	RELAY (RY3)	FOIL PATTERN ON P.W.B.	EXCEED MAX. HEATING TIME	OVEN LAMP OR SOCKET	SHORTED IN POWER CORD	SHORT OR OPENED WIRING	WRONG OPERATION	LOW VOLTAGE	DIRTY OVEN CAVITY	MISADJUSTMENT SWITCH
CONDITION	PROBLEM																											
OFF CONDITION	Home fuse or circuit breaker blows when power cord is plugged into wall outlet.																											
	Fuse M10A blows when power cord is plugged into wall receptacle.								●			●				●		●						●				●
	_____ does not appear in display when power cord is first plugged into wall outlet.									●	●	●				●				●				●		●		
	Oven lamp does not light when door is opened.							●								●			●			●		●				
COOKING CONDITION	Oven lamp lights but fan motor and antenna motor do not operate.				●								●	●										●				●
	Oven does not go into cook cycle when START pad is touched.							●								●	●		●					●	●			●
	Oven seems to be operating but little or no heat is produced in oven load. (Food incompletely cooked or not cooked at all at end of cook cycle.)	●	●	●	●		●								●	●		●						●		●		●
	Oven goes into a cook cycle but extremely uneven heating is produced in oven load (food).													●										●		●	●	
	Oven does not cook properly when programmed for Cooking Power 5 mode. (Operates properly on Cooking Power 10 (HIGH) mode.)															●		●										
ERROR MODE	"EE9" Maximum time is exceeded.															●					●							

TEST PROCEDURES

PROCEDURE LETTER	COMPONENT TEST								
A	MAGNETRON TEST <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p>NEVER TOUCH ANY PART IN THE CIRCUIT WITH YOUR HAND OR AN INSULATED TOOL WHILE THE OVEN IS IN OPERATION.</p> </div> <p>CARRY OUT <u>3D</u> CHECKS.</p> <p>Isolate the magnetron from high voltage circuit by removing all leads connected to filament terminal.</p> <p>To test for an open circuit filament use an ohmmeter to make a continuity test between the magnetron filament terminals, the meter should show a reading of less than 1 ohm.</p> <p>To test for short filament to anode condition, connect ohmmeter between one of the filament terminals and the case of the magnetron (ground). This test should be indicated an infinite resistance. If a low or zero resistance reading is obtained then the magnetron should be replaced.</p> <p>MICROWAVE OUTPUT POWER (1 litre load)</p> <p>The following test procedure should be carried out with the microwave oven in a fully assembled condition (outer case fitted). Microwave output power from the magnetron can be measured by way of IEC 705, i.e. it is measured by how much power the water load can absorb. To measure the microwave output power in the microwave oven, the relation of calorie and watt is used. When P(W) heating works for t(second), approximately $P \times t / 4.187$ calorie is generated. On the other hand, if the temperature of the water with V(ml) rises ΔT ($^{\circ}\text{C}$) during this microwave heating period, the calorie of the water is $V \times \Delta T$.</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p>The formula is as follows;</p> $P \times t / 4.187 = V \times \Delta T \quad P \text{ (W)} = 4.187 \times V \times \Delta T / t$ <p>Our condition for water load is as follows:</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">Room temperature around 20°C</td> <td style="width: 50%;">Power supply Voltage Rated voltage</td> </tr> <tr> <td>Water load 1000 g</td> <td>Initial temperature $10 \pm 2^{\circ}\text{C}$</td> </tr> <tr> <td>Heating time 42 sec.</td> <td></td> </tr> <tr> <td>$P = 100 \times \Delta T$</td> <td></td> </tr> </table> </div> <p>Measuring condition:</p> <ol style="list-style-type: none"> Container The water container must be a cylindrical borosilicate glass vessel having a maximum material thickness of 3 mm and an outside diameter of approximately 190 mm. Temperature of the oven and vessel The oven and the empty vessel are at ambient temperature prior to the start the test. Temperature of the water The initial temperature of the water is $(10 \pm 2)^{\circ}\text{C}$. Select the initial and final water temperature so that the maximum difference between the final water temperature and the ambient temperature is 5°C. Select stirring devices and measuring instruments in order to minimize addition or removal of heat. The graduation of the thermometer must be scaled by 0.1°C at minimum and be an accurate thermometer. The water load must be (1000 ± 5) g. "t" is measured while the microwave generator is operating at full power. Magnetron filament heat-up time is not included. <p>NOTE: The operation time of the microwave oven is "t + 2" sec. (2 sec. is magnetron filament heat-up time.)</p> <p>Measuring method:</p> <ol style="list-style-type: none"> Measure the initial temperature of the water before the water is added to the vessel. (Example: The initial temperature $T_1 = 11^{\circ}\text{C}$) Add the 1 litre water to the vessel. Place the load on the centre of the shelf. Operate the microwave oven at HIGH for the temperature of the water rises by a value ΔT of (10 ± 2) K. Stir the water to equalize temperature throughout the vessel. Measure the final water temperature. (Example: The final temperature $T_2 = 21^{\circ}\text{C}$) Calculate the microwave power output P in watts from above formula. 	Room temperature around 20°C	Power supply Voltage Rated voltage	Water load 1000 g	Initial temperature $10 \pm 2^{\circ}\text{C}$	Heating time 42 sec.		$P = 100 \times \Delta T$	
Room temperature around 20°C	Power supply Voltage Rated voltage								
Water load 1000 g	Initial temperature $10 \pm 2^{\circ}\text{C}$								
Heating time 42 sec.									
$P = 100 \times \Delta T$									

TEST PROCEDURES

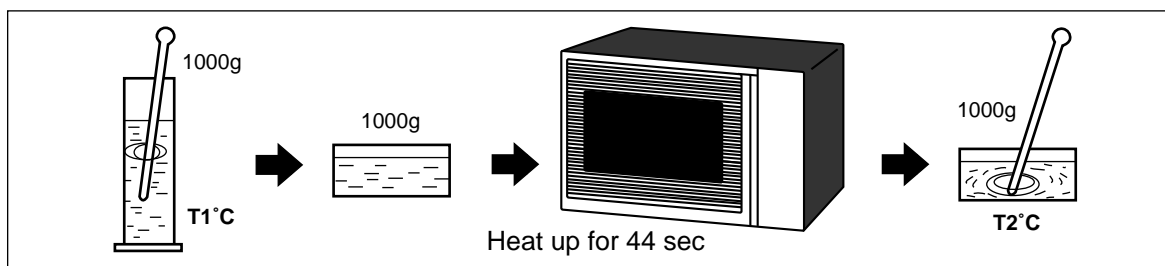
PROCEDURE
LETTER

COMPONENT TEST

Initial temperature $T1 = 11^{\circ}\text{C}$
 Temperature after $(42 + 2) = 44$ sec $T2 = 21^{\circ}\text{C}$
 Temperature difference Cold-Warm $\Delta T1 = 10^{\circ}\text{C}$
 Measured output power
 The equation is " $P = 100 \times \Delta T$ " $P = 100 \times 10^{\circ}\text{C} = 1000$ Watts

JUDGMENT: The measured output power should be at least $\pm 15\%$ of the rated output power.

CAUTION: 1°C CORRESPONDS TO 100 WATTS. REPEAT MEASUREMENT IF THE POWER IS INSUFFICIENT.

**B HIGH VOLTAGE TRANSFORMER TEST**

WARNING: High voltage and large currents are present at the secondary winding and filament winding of the high voltage transformer. It is very dangerous to work near this part when the oven is on. NEVER make any voltage measurements of the high-voltage circuits, including the magnetron filament.

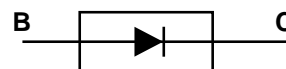
CARRY OUT 3D CHECKS.

Disconnect the leads to the primary winding of the high voltage transformer. Disconnect the filament and secondary winding connections from the rest of the HV circuitry. Using an ohmmeter, set on a low range, it is possible to check the continuity of all three windings. The following readings should be obtained:-

- a. Primary winding approximately $1.3\ \Omega$
- b. Secondary winding approximately $86\ \Omega$
- c. Filament winding less than $1\ \Omega$

If the readings obtained are not stated as above, then the high voltage transformer is probably faulty and should be replaced.

CARRY OUT 4R CHECKS.

C HIGH VOLTAGE RECTIFIER ASSEMBLY TEST

HIGH VOLTAGE RECTIFIER

CARRY OUT 3D CHECKS.

Isolate the high voltage rectifier assembly from the HV circuit. The high voltage rectifier can be tested using an ohmmeter set to its highest range. Connect the ohmmeter across the terminal B+C of the high voltage rectifier and note the reading obtained. Reverse the meter leads and note this second reading. The normal resistance is infinite in one direction and more than $100\ \text{k}\Omega$ in the other direction.

CARRY OUT 4R CHECKS.

NOTE: FOR MEASUREMENT OF THE RESISTANCE OF THE RECTIFIER, THE BATTERIES OF THE MEASURING INSTRUMENT MUST HAVE A VOLTAGE AT LEAST 6 VOLTS, BECAUSE OTHERWISE AN INFINITE RESISTANCE MIGHT BE SHOWN IN BOTH DIRECTIONS.

D HIGH VOLTAGE CAPACITOR TEST

CARRY OUT 3D CHECKS.

- A. Isolate the high voltage capacitor from the circuit.
- B. Continuity check must be carried out with measuring instrument which is set to the highest resistance range.
- C. A normal capacitor shows continuity for a short time (kick) and then a resistance of about $10\text{M}\Omega$ after

TEST PROCEDURES

PROCEDURE LETTER	COMPONENT TEST												
	<p>it has been charged.</p> <p>D. A short-circuited capacitor shows continuity all the time.</p> <p>E. An open capacitor constantly shows a resistance about 10 MΩ because of its internal 10MΩ resistance.</p> <p>F. When the internal wire is opened in the high voltage capacitor shows an infinite resistance.</p> <p>G. The resistance across all the terminals and the chassis must be infinite when the capacitor is normal.</p> <p>If incorrect reading are obtained, the high voltage capacitor must be replaced.</p> <p>CARRY OUT <u>4R</u> CHECKS.</p>												
E	<p><u>SWITCH TEST</u></p> <p>CARRY OUT <u>3D</u> CHECKS.</p> <p>Isolate the switch to be tested and using an ohmmeter check between the terminals as described in the following table.</p> <p>Table: Terminal Connection of Switch</p> <table> <tr> <td>Plunger Operation</td><td>COM to NO</td><td>COM to NC</td><td>COM; Common terminal,</td></tr> <tr> <td>Released</td><td>Open circuit</td><td>Short circuit</td><td>NO; Normally open terminal</td></tr> <tr> <td>Depressed</td><td>Short circuit</td><td>Open circuit</td><td>NC; Normally close terminal</td></tr> </table> <p>If incorrect readings are obtained, make the necessary switch adjustment or replace the switch.</p> <p>CARRY OUT <u>4R</u> CHECKS.</p>	Plunger Operation	COM to NO	COM to NC	COM; Common terminal,	Released	Open circuit	Short circuit	NO; Normally open terminal	Depressed	Short circuit	Open circuit	NC; Normally close terminal
Plunger Operation	COM to NO	COM to NC	COM; Common terminal,										
Released	Open circuit	Short circuit	NO; Normally open terminal										
Depressed	Short circuit	Open circuit	NC; Normally close terminal										
F	<p><u>THERMAL CUT-OUT TEST</u></p> <p>CARRY OUT <u>3D</u> CHECKS.</p> <p>Disconnect the leads from the terminals of the thermal cut-out. Then using an ohmmeter, make a continuity test across the two terminals as described in the below.</p> <p>Table: Thermal Cut-out Test</p> <table> <tr> <td>Parts Name</td><td>Temperature of "ON" condition (closed circuit). (°C)</td><td>Temperature of "OFF" condition (open circuit). (°C)</td><td>Indication of ohmmeter (When room temperature is approx. 20°C.)</td></tr> <tr> <td>Thermal cut-out 125°C</td><td>This is not resetable type.</td><td>Above 125°C</td><td>Closed circuit</td></tr> <tr> <td>Thermal cut-out 145°C</td><td>This is not resetable type.</td><td>Above 145°C</td><td>Closed circuit</td></tr> </table> <p>If incorrect readings are obtained, replace the thermal cut-out.</p> <p>An open circuit thermal cut-out (MG) indicates that the magnetron has overheated, this may be due to restricted ventilation, cooling fan failure or a fault condition within the magnetron or HV. circuit.</p> <p>An open circuit thermal cut-out (OVEN) indicates that the food in the oven cavity may catch fire, this may be due to over heating produced by improper setting of the cooking timer or failure of the control panel.</p> <p>CARRY OUT <u>4R</u> CHECKS.</p>	Parts Name	Temperature of "ON" condition (closed circuit). (°C)	Temperature of "OFF" condition (open circuit). (°C)	Indication of ohmmeter (When room temperature is approx. 20°C.)	Thermal cut-out 125°C	This is not resetable type.	Above 125°C	Closed circuit	Thermal cut-out 145°C	This is not resetable type.	Above 145°C	Closed circuit
Parts Name	Temperature of "ON" condition (closed circuit). (°C)	Temperature of "OFF" condition (open circuit). (°C)	Indication of ohmmeter (When room temperature is approx. 20°C.)										
Thermal cut-out 125°C	This is not resetable type.	Above 125°C	Closed circuit										
Thermal cut-out 145°C	This is not resetable type.	Above 145°C	Closed circuit										
G	<p><u>BLOWN FUSE M10A</u></p> <p>CARRY OUT <u>3D</u> CHECKS.</p> <p>If the fuse M10A is blown when the door is opened, check the 1st. interlock switch, monitor switch and monitor resistor.</p> <p>If the fuse M10A is blown, there could be a short or ground in electrical parts or wire harness. Check them and replace the defective parts or repair the wire harness.</p> <p>CARRY OUT <u>4R</u> CHECKS.</p> <p>CAUTION: Only replace fuse M10A with the correct value replacement.</p>												

TEST PROCEDURES

PROCEDURE
LETTER

COMPONENT TEST

H

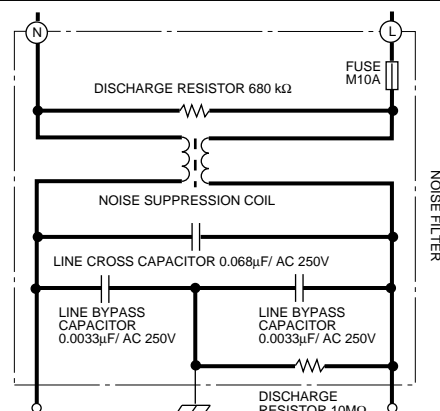
NOISE FILTER TESTCARRY OUT 3D CHECKS.

Disconnect the leads from the terminals of noise filter.

Using an ohmmeter, check between the terminals as described in the following table.

MEASURING POINTS	INDICATION OF OHMMETER
Between N and L	Approx. 680 k Ω
Between terminal N and WHITE	Short circuit
Between terminal L and RED	Short circuit

If incorrect readings are absorbed, replace the noise filter unit.

CARRY OUT 4R CHECKS.

I

MOTOR WINDING TESTCARRY OUT 3D CHECKS.

Disconnect the leads from the motor. Using an ohmmeter, check the resistance between the two terminals as described in the table below.

Table: Resistance of Motor

Motors	Resistance
Fan motor	Approximately 219 Ω
Antenna motor	Approximately 11 k Ω

If incorrect readings are obtained, replace the motor.

CARRY OUT 4R CHECKS.

J

HIGH VOLTAGE FUSE TSTCARRY OUT 3D CHECKS.

If the high voltage fuse is blown, there could be a short in the high voltage rectifier or the magnetron. Check them and replace the defective parts and the high voltage fuse.

CARRY OUT 4R CHECKS.**CAUTION:** Only replace high voltage fuse with the correct value replacement.

K

TOUCH CONTROL PANEL ASSEMBLY TEST

The touch control panel consists of circuits including semiconductors such as LSI, ICs, etc. Therefore, unlike conventional microwave ovens, proper maintenance can not be performed with only a voltmeter and ohmmeter.

In this service manual, the touch control panel assembly is divided into two units, Control Unit and Key Unit and troubleshooting by replacement is described according to the symptoms indicated.

1. Key Unit Note : Check key unit ribbon connection before replacement.

The following symptoms indicate a defective key unit. Replace the key unit.

- When touching the pads, a certain pad produces no signal at all.
- When touching a number pad, two figures or more are displayed.
- When touching the pads, sometimes a pad produces no signal.

2. Control Panel

The following symptoms indicate a defective control unit. Before replacing the control unit, perform the key unit test (Procedure L) to determine if control unit is faulty.

2-1 In connection with pads

- When touching the pads, a certain group of pads do not produce a signal.
- When touching the pads, no pads produce a signal.

2-2 In connection with indicators

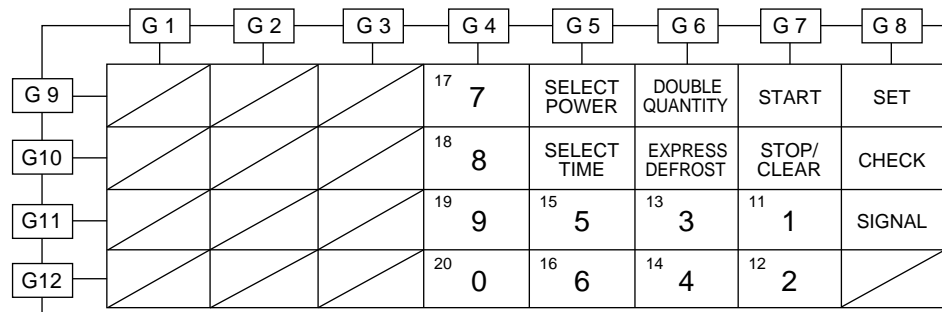
- At a certain digit, all or some segments do not light up.
- At a certain digit, brightness is low.
- Only one indicator does not light up.
- The corresponding segments of all digits do not light up; or they continue to light up.

TEST PROCEDURES

PROCEDURE LETTER	COMPONENT TEST
	e) Wrong figure appears. f) A certain group of indicators do not light up. g) The figure of all digits flicker. 2-3 Other possible troubles caused by defective control unit. a) Buzzer does not sound or continues to sound. b) Clock does not operate properly. c) Cooking is not possible.

L KEY UNIT TEST

If the display fails to clear when the STOP/CLEAR pad is depressed, first verify the flat ribbon cable is marking good contact, verify that the door sensing switch (stop switch) operates properly; that is the contacts are closed when the door is closed and open when the door is open. If the door sensing switch (stop switch) is good, disconnect the flat ribbon cable that connects the key unit to the control unit and make sure the door sensing switch is closed (either close the door or short the door sensing switch connector). Use the Key unit matrix indicated on the control panel schematic and place a jumper wire between the pins that correspond to the STOP/CLEAR pad marking momentary contact. If the control unit responds by clearing with a beep the key unit is faulty and must be replaced. If the control unit does not respond, it is a faulty and must be replaced. If a specific pad does not respond, the above method may be used (after clearing the control unit) to determine if the control unit or key pad is at fault.



CARRY OUT 4R CHECKS.

M RELAY TEST

CARRY OUT 3D CHECKS.

Remove the outer case and check voltage between Pin Nos. 3 and 7 of the 3 pin connector (A) on the control unit with an A.C. voltmeter.

The meter should indicate 230-240 volts, if not check oven circuit.

Relay Test

Check voltage at the relay coil with a D.C. voltmeter during the microwave cooking operation.

DC. voltage indicated Defective relay.

DC. voltage not indicated Check diode which is connected to the relay coil. If diode is good, control unit is defective.

RELAY SYMBOL	OPERATIONAL VOLTAGE	CONNECTED COMPONENTS
RY2	Approx. 18.0V D.C.	High voltage transformer
RY3	Approx. 18.0V D.C.	Oven lamp / Antenna motor / Fan motor

CARRY OUT 4R CHECKS.

TEST PROCEDURES

PROCEDURE LETTER	COMPONENT TEST
N	PROCEDURES TO BE TAKEN WHEN THE FOIL PATTERN ON THE PRINTED WIRING BOARD (PWB) IS OPEN

To protect the electronic circuits, this model is provided with a fine foil pattern added to the input circuit on the PWB, this foil pattern acts as a fuse. If the foil pattern is open, follow the troubleshooting guide given below for repair.

Problem: POWER ON, indicator does not light up.

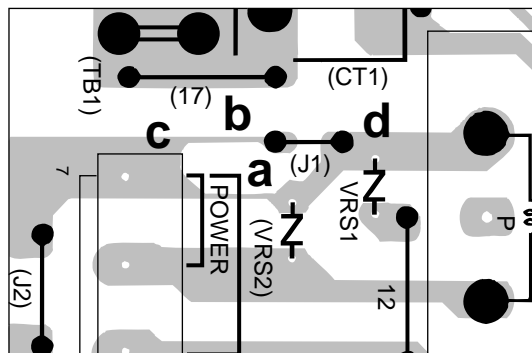
CARRY OUT 3D CHECKS.

STEPS	OCCURRENCE	CAUSE OR CORRECTION
1	The rated AC voltage is not present at Power terminal of CPU connector (CN-A).	Check supply voltage and oven power cord.
2	The rated AC voltage is present at primary side of low voltage transformer.	Low voltage transformer or secondary circuit defective. Check and repair.
3	Only pattern at "a" is broken.	*Insert jumper wire J1 and solder. (CARRY OUT <u>3D</u> CHECKS BEFORE REPAIR)
4	Pattern at "a" and "b" are broken.	*Insert the coil RCILF2003YAZZ between "c" and "d". (CARRY OUT <u>3D</u> CHECKS BEFORE REPAIR)

NOTE: *At the time of these repairs, make a visual inspection of the varistor for burning damage and examine the transformer with tester for the presence of layer short circuit (check primary coil resistance).

If any abnormal condition is detected, replace the defective parts.

CARRY OUT 4R CHECKS.



TOUCH CONTROL PANEL ASSEMBLY

OUTLINE OF TOUCH CONTROL PANEL

The touch control section consists of the following units as shown in the touch control panel circuit.

- (1) Control Unit
- (2) Key Unit

The principal functions of these units and the signals communicated among them are explained below.

1. Control Unit

Signal of key touch and oven function control are all processed by one microcomputer.

1) Power Supply Circuit

This circuit changes output voltage at the secondary side of the low voltage (T1) transformer to voltages required at each part by full wave rectifying circuit, constant voltage circuit, etc..

2) ACL Circuit

This is an Auto-clear Circuit, i.e., a reset circuit, which enables IC1 to be activated from initial state.

3) Power SYNC Signal Generating Circuit

This is a circuit for generating power SYNC signal by virtue of the secondary side output of transformer T1. This signal is used for a basic frequency to time processing and so on.

4) Clock Circuit

This is a circuit for controlling clock frequency required for operating IC1.

5) IC1 (Main Processor)

This is a one-chip microcomputer, responsible for controlling the entire control unit.

6) IC2 (Memory Processor)

This is a memory IC, responsible for memory function.

7) IC3

This is a IC for driving light emitting diode.

8) Display Circuit

This is a circuit for driving light emitting diode by IC1 output.

9) Key Input Circuit

This is a circuit for transmitting key input information to IC1.

10) Sound-body Driving Circuit

This is a circuit for driving sound body by IC1 output.

11) Relay Driving Circuit

This is a circuit for driving output relay by IC1 output.

12) Door Sensing Switch Circuit

This is a circuit for driving IC1 to detect door opening/closing.

2. Key Unit

The key unit is composed of a matrix circuit in which when a key is touched, one of signals P30--P34 generated by the LSI, is passed through the key and returned to the LSI as one of signals P24--P27.

This model has 20 Memory pads.

When the oven is shipped, Memory pad 1 to 10 are set as follows: fig.1.

Memory No.	Cook Time	Output Power
1	10 sec.	100%
2	20 sec.	100%
3	30 sec.	100%
4	45 sec.	100%
5	1 min.	100%
6	1 min. 15 sec.	100%
7	1 min. 30 sec.	100%
8	2 min.	100%
9	2 min. 30 sec.	100%
0	3 min.	100%

(fig. 1)

This model has a double quantity pad. When the oven is shipped, Magnification "1.7" is preset in the double quantity pad.

This model has an express defrost pad. When the oven is shipped, express defrost is set as follows: fig.2.

	1 STAGE	2 STAGE	3 STAGE
FORMULA	$P = 0.2T$	$P = 0.15T$	$P = 0.65T$
POWER	60 %	40 %	20 %

T : Total cooling time

(fig. 2)

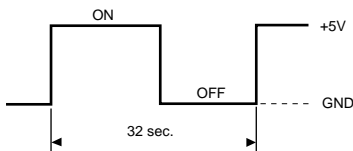
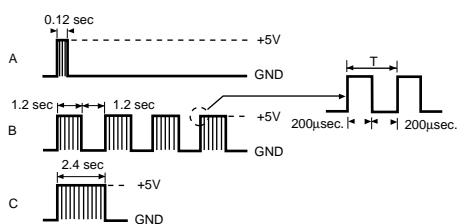
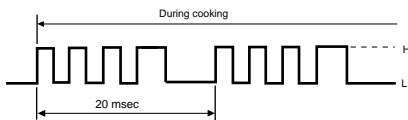
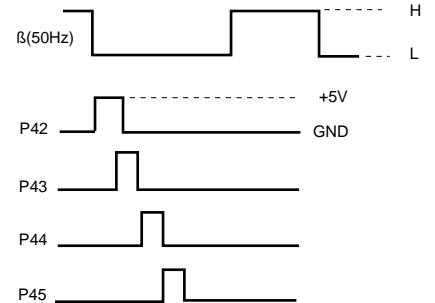
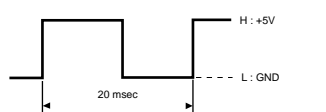
When 1/2 total cooking time is passed, the signal will sound and "CHECK" indicator will flash

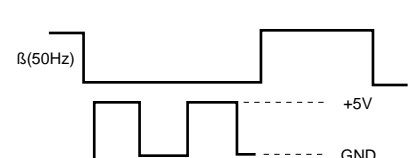
DESCRIPTION OF LSI

LSI(IZA897DR)

The I/O signal of the LSI(IZA897DR) is detailed in the following table.

Pin No.	Signal	I/O	Description
1	VCC	IN	Power source voltage: +5V. VC voltage of power source circuit input.
2/3	VEE/AVSS	IN	Connected to GND
4	VREF	IN	Connected to VC. (+5V)
5-6	AN7-AN6	IN	Terminal not used.

Pin No.	Signal	I/O	Description																																										
7-8	AN5-AN4	IN	Terminal to change functions according to the model. Signal in accordance with the model in operation is applied to set up its function.																																										
9-10	AN3-AN2	IN	Terminal not used.																																										
11	AN1	IN	Input signal which communicates the door open/close information to LSI. Door closed; "L" level signal (0V). Door opened; "H" level signal (+5V).																																										
12	AN0	IN	Terminal not used.																																										
13	P55	OUT	Magnetron high-voltage circuit driving signal. To turn on and off the cook relay. In 100% power level operation, "H" level during cooking; "L" level otherwise. In other power level operation (90,80,70,60,50,40,30,20,10 or 0%), "H" and "L" level is repeated according to power level. <table><tr><td>Power level</td><td>ON</td><td>OFF</td><td>Power level</td><td>ON</td><td>OFF</td></tr><tr><td>100%</td><td>32sec.</td><td>0sec.</td><td>40%</td><td>16sec.</td><td>16sec.</td></tr><tr><td>90%</td><td>30sec.</td><td>2sec.</td><td>30%</td><td>12sec.</td><td>20sec.</td></tr><tr><td>80%</td><td>26sec.</td><td>6sec.</td><td>20%</td><td>8sec.</td><td>24sec.</td></tr><tr><td>70%</td><td>24sec.</td><td>8sec.</td><td>10%</td><td>6sec.</td><td>26sec.</td></tr><tr><td>60%</td><td>22sec.</td><td>10sec.</td><td>0%</td><td>0sec.</td><td>32sec.</td></tr><tr><td>50%</td><td>18sec.</td><td>14sec.</td><td></td><td></td><td></td></tr></table> 	Power level	ON	OFF	Power level	ON	OFF	100%	32sec.	0sec.	40%	16sec.	16sec.	90%	30sec.	2sec.	30%	12sec.	20sec.	80%	26sec.	6sec.	20%	8sec.	24sec.	70%	24sec.	8sec.	10%	6sec.	26sec.	60%	22sec.	10sec.	0%	0sec.	32sec.	50%	18sec.	14sec.			
Power level	ON	OFF	Power level	ON	OFF																																								
100%	32sec.	0sec.	40%	16sec.	16sec.																																								
90%	30sec.	2sec.	30%	12sec.	20sec.																																								
80%	26sec.	6sec.	20%	8sec.	24sec.																																								
70%	24sec.	8sec.	10%	6sec.	26sec.																																								
60%	22sec.	10sec.	0%	0sec.	32sec.																																								
50%	18sec.	14sec.																																											
14-15	P54-P53	OUT	Terminal not used.																																										
16-18	P52-P50	IN	Terminal not used.																																										
19	P47	OUT	Signal to sound buzzer. This signal is to control the 2.5kHz continuous signal through IC3. A: key touch sound. B: Guidance sound. C: Completion sound. 																																										
20	P46	OUT	Oven lamp, Fan motor and Antenna motor driving signal. (Square Waveform : 50Hz) To turn on and off the shut-off relay (RY3). The Square waveform voltage is delivered to the RY3 driving circuit and relays(RY2, COOK RELAY) control circuit. 																																										
21	P45	OUT	Digit selection signal. The relation between digit signal and digit are as follows: Digit signal Digit P42 1st. P43 2nd. P44 3rd. P45 4th. Normally, one pulse is output in every β period, and input to the grid of the light-emitting diode. 																																										
22-24	P44-P42	OUT	Digit selection signal. Signal similar to P45.																																										
25	INT1	IN	Signal synchronized with commercial power source frequency. This is basic timing for all time processing of LSI. 																																										
26	P40	IN	Connected to GND through resistor.																																										

Pin No.	Signal	I/O	Description																												
27	RESET	IN	Auto clear terminal. Signal is input to reset the LSI to the initial state when power is supplied. Temporarily set to "L" level the moment power is supplied, at this time the LSI is reset. Thereafter set at "H" level.																												
28	P71	OUT	Memory (EEPROM) clock output.																												
29	P70	IN/OUT	Memory (EEPROM) data input/output.																												
30	XIN	IN	Internal clock oscillation frequency setting input. The internal clock frequency is set by inserting the ceramic filter oscillation circuit with respect to XOUT terminal.																												
31	XOUT	OUT	Internal clock oscillation frequency control output. Output to control oscillation input of XIN.																												
32	VSS	IN	Connected to GND.																												
33	P27	IN	Signal coming from touch key. When either one of G-12 line keys on key matrix is touched, a corresponding signal out of P30, P31, P32, P33, P34 will be input into P27. When no key is touched, the signal is held at "L" level.																												
34	P26	IN	Signal similar to P27. When either one of G-11 line keys on key matrix is touched, a corresponding signal will be input into P26.																												
35	P25	IN	Signal similar to P27. When either one of G-10 line keys on key matrix is touched, a corresponding signal will be input into P25.																												
36	P24	IN	Signal similar to P27. When either one of G-9 line keys on key matrix is touched, a corresponding signal will be input into P24.																												
37-38	P23-P22	OUT	Terminal not used.																												
39-40	P21-P20	OUT	Segment data signals. The relation between signals and indicators are as follows: <table> <tr> <td>Signal</td><td>Segment</td><td>Signal</td><td>Segment</td></tr> <tr> <td>P21,P20</td><td>..... 1</td><td>P05,P04</td><td>..... 7</td></tr> <tr> <td>P17,P16</td><td>..... 2</td><td>P03,P02</td><td>..... 8</td></tr> <tr> <td>P15,P14</td><td>..... 3</td><td>P01,P00</td><td>..... 9</td></tr> <tr> <td>P13,P12</td><td>..... 4</td><td></td><td></td></tr> <tr> <td>P11,P10</td><td>..... 5</td><td></td><td></td></tr> <tr> <td>P07,P06</td><td>..... 6</td><td></td><td></td></tr> </table> 	Signal	Segment	Signal	Segment	P21,P20 1	P05,P04 7	P17,P16 2	P03,P02 8	P15,P14 3	P01,P00 9	P13,P12 4			P11,P10 5			P07,P06 6		
Signal	Segment	Signal	Segment																												
P21,P20 1	P05,P04 7																												
P17,P16 2	P03,P02 8																												
P15,P14 3	P01,P00 9																												
P13,P12 4																														
P11,P10 5																														
P07,P06 6																														
41-48	P17-P10	OUT	Segment data signal. Signal similar to P21.																												
49-56	P07-P00	OUT	Segment data signal. Signal similar to P21.																												
57-59	P37-P35	OUT	Terminal not used.																												
60	P34	OUT	Key strobe signal. Signal applied to touch-key section. A pulse signal is input to P27, P26, P25 and P24 terminals while one of G4 line keys on key matrix is touched.																												
61	P33	OUT	Key strobe signal. Signal applied to touch-key section. A pulse signal is input to P27, P26, P25 and P24 terminals while one of G5 line keys on key matrix is touched.																												
62	P32	OUT	Key strobe signal. Signal applied to touch-key section. A pulse signal is input to P27, P26, P25 and P24 terminals while one of G6 line keys on key matrix is touched.																												
63	P31	OUT	Key strobe signal. Signal applied to touch-key section. A pulse signal is input to P27, P26, P25 and P24 terminals while one of G7 line keys on key matrix is touched.																												
64	P30	OUT	Key strobe signal. Signal applied to touch-key section. A pulse signal is input to P27, P26, P25 and P24 terminals while one of G8 line keys on key matrix is touched.																												

2-2 Memory IC (IC2)

X24C02P is a 2K-bit, serial memory, enabling CMOS to be erased/written electrically. This memory is constructed with 256 registers x 8bits, enabling individual access, read and write operations to be performed. Details of input/output signal for IC2 are as shown in the following diagram.

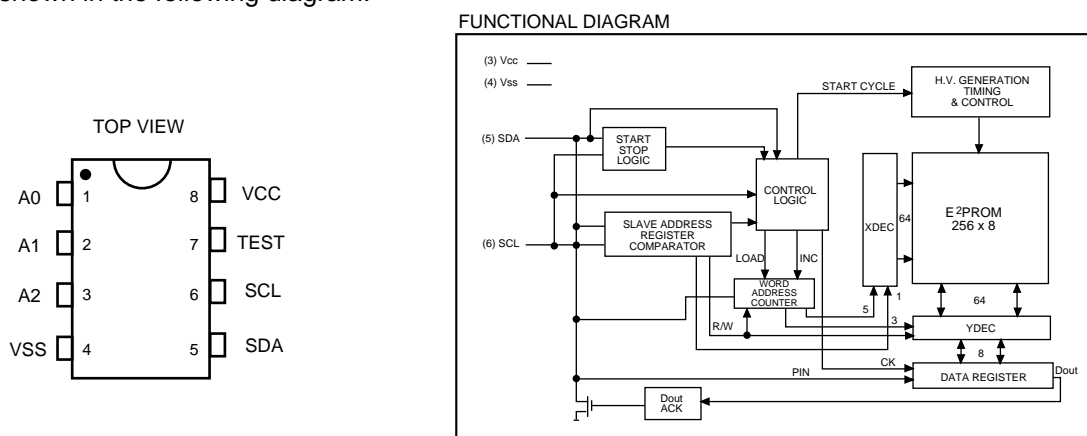


Table 1. Relation between Pin Nos, and Signals

Pin No.	Signal	I/O	Description
1-3	A0-A2	IN	Connected to +5V.
4	VSS	IN	Connected to GND.
5	SDA	IN/OUT	Serial data input/output : input/outputs data to IC1.
6	SCL	IN	Clock signal input : input/outputs serial data at every one pulse.
7	TEST	IN	Connected to GND.
8	VCC	IN	Connected to +5V.

When the memory IC (IC2) or control unit is exchanged, input the relay timing to the memory IC (IC2), referring to the "How to input the relay timing". Otherwise the oven will make a big noise when starting.

How to input the relay timing

■ ... Flashing / ○ ... 0.1sec BUZZER

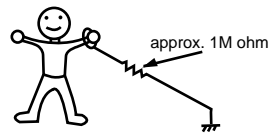
PAD	DISPLAY	INDICATOR	PHONE
(Door close)	.		
CHECK	.	CHECK No.	○
CHECK	8 2 6 8 (user total count)	CHECK	○
SIGNAL SIGNAL DOUBLE QUANTITY	3 4 5 6 (service total count upper figure 3456XX)		○
7	7	No.	○
(after 1 sec.)	3 8 6 9		
SET	0		○
3. 8. 4. 9	3 8 4 9		○ x 4
SET	3 8 4 9		○
CHECK	.		○

TOUCH CONTROL PANEL SERVICING

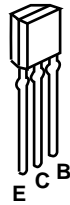
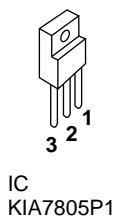
1. Precautions for Handling Electronic Components

This unit uses CMOS LSI in the integral part of the circuits. When handling these parts, the following precautions should be strictly followed. CMOS LSI have extremely high impedance at its input and output terminals. For this reason, it is easily influenced by the surrounding high voltage power source, static electricity charge in clothes, etc. and sometimes it is not fully protected by the built-in protection circuit. In order to protect CMOS LSI.

- 1) When storing and transporting, thoroughly wrap them in aluminium foil. Also wrap all PW boards containing them in aluminium foil.
- 2) When soldering, ground the technician as shown in the figure and use grounded soldering iron and work table.



2. Shapes of Electronic Components



Transistor
DTA123ES
DTB143ES
DTC143ES
DTD143ES

3. Servicing of Touch Control Panel

We describe the procedures to permit servicing of the touch control panel of the microwave oven and the precautions you must take when doing so. To perform the servicing, power to the touch control panel is available either from the power line of the oven itself or from an external power source.

(1) Servicing the touch control panel with power supply of the oven:

CAUTION:

THE HIGH VOLTAGE TRANSFORMER OF THE MICROWAVE OVEN IS STILL LIVE DURING SERVICING PRESENTS A HAZARD.

Therefore, before checking the performance of the touch control panel,

- 1) Disconnect the power supply cord, and then remove outer case.
- 2) Open the door and block it open.
- 3) Discharge high voltage capacitor.
- 4) Disconnect the leads to the primary of the power transformer.
- 5) Ensure that these leads remain isolated from other components and oven chassis by using insulation tape.
- 6) After that procedure, re-connect the power supply cord.

After checking the performance of the touch control panel,

- 1) Disconnect the power supply cord.
- 2) Open the door and block it open.
- 3) Re-connect the leads to the primary of the power

transformer.

- 4) Re-install the outer case (cabinet).
- 5) Re-connect the power supply cord after the outer case is installed.
- 6) Run the oven and check all functions.

- A. On some models, the power supply cord between the touch control panel and the oven itself is so short that the two can't be separated. For those models, check and repair all the controls (sensor-related ones included) of the touch control panel while keeping it connected to the oven.
- B. On some models, the power supply cord between the touch control panel and the oven proper is long enough that they may be separated from each other. For those models, therefore, it is possible to check and repair the controls of the touch control panel while keeping it apart from the oven proper; in this case you must short both ends of the door sensing switch (on PWB) of the touch control panel with a jumper, which brings about an operational state that is equivalent to the oven door being closed. As for the sensor-related controls of the touch control panel, checking them is possible if dummy resistor(s) with resistance equal to that of the controls are used.

(2) Servicing the touch control panel with power supply from an external power source:

Disconnect the touch control panel completely from the oven proper, and short both ends of the door sensing switch (on PWB) of the touch control panel, which brings about an operational state that is equivalent to the oven door being closed. Connect an external power source to the power input terminal of the touch control panel, then it is possible to check and repair the controls of the touch control panel it is also possible to check the sensor-related controls of the touch control panel by using the dummy resistor(s).

4. Servicing Tools

Tools required to service the touch control panel assembly.

- 1) Soldering iron: 30W
(It is recommended to use a soldering iron with a grounding terminal.)
- 2) Oscilloscope: Single beam, frequency range: DC-10MHz type or more advanced model.
- 3) Others: Hand tools

5. Other Precautions

- 1) Before turning on the power source of the control unit, remove the aluminium foil applied for preventing static electricity.
- 2) Connect the connectors of the key unit to the control unit being sure that the lead wires are not twisted.
- 3) After aluminium foil is removed, be careful that abnormal voltage due to static electricity etc. is not applied to the input or output terminals.
- 4) Attach connectors, electrolytic capacitors, etc. to PWB, making sure that all connections are tight.
- 5) Be sure to use specified components where high precision is required.

PROCEDURE FOR CHECKING/CLEARING SERVICE COUNTS OF MICROWAVE OVEN

The following procedure enables the servicer to obtain the total using times (cook cycles) since the microwave oven is purchased and the total operation time (hours) since the microwave oven is purchased. The maximum capacity of the total using is 999,999 times, and the maximum capacity of total operation time is 999,999 hours.

1) Practice for checking total using times (Ex. 345678 times).

... Flashing / ○... 0.1sec BUZZER

PAD	DISPLAY	INDICATOR	PHONE
(Door close)	.		
CHECK	.	CHECK No.	○
CHECK	82 68 (user total count)	CHECK	○
[SIGNAL SIGNAL DOUBLE QUANTITY	↓		
	34 56 (service total count upper figure) 3456XX		○
	↓		
1 (No 1) (after 1 sec.)	↓ 1 34 56	No.	○
2 (No 2) (after 1 sec.)	(service total count upper figure) ↓ 2	No.	○
	78 (service total count lower figure)		
CHECK	.		○

2) Practice for checking total operation time (Ex. 4567 hours).

... Flashing / ○... 0.1sec BUZZER

PAD	DISPLAY	INDICATOR	PHONE
(Door close)	.		
CHECK	.	CHECK No.	○
CHECK	82 68 (user total count)	CHECK	○
[SIGNAL SIGNAL DOUBLE QUANTITY	↓		
	34 56 (service total count upper figure) 3456XX		○
	↓		
9 (No 9) (after 1 sec.)	↓ 9 45 (Total operation time upper figure)	No.	○
0 (No 0) (after 1 sec.)	↓ 0	No.	○
	67 (Total operation time lower figure)		
CHECK	.		○

3) Practice for inputting total using times (Ex. 310000 times).

... Flashing / ○... 0.1sec BUZZER

PAD	DISPLAY	INDICATOR	PHONE
(Door close)	.		
CHECK	.	CHECK No.	○
CHECK	82 68 (user total count)	CHECK	○
[SIGNAL SIGNAL DOUBLE QUANTITY	↓		
	34 56 (service total count upper figure) 3456XX		○
	↓		
2 (after 1 sec.)	↓ 2 78 (service total count lower figure) XXXX78	No.	○
1 (after 1 sec.) SET 3,1,0,0 SET	↓ 1 34 56 0	No.	○
	31 00		○ x 4
	31,00		○
2 (after 1 sec.) SET 0 SET	↓ 2 78 0	No.	○
	0		○
	0 (service total count 310000 set)		○
CHECK	.		○

4) Practice for inputting total operation time (Ex. 1234 hours).

... Flashing / ○... 0.1sec BUZZER

PAD	DISPLAY	INDICATOR	PHONE
(Door close)	.		
CHECK	.	CHECK No.	○
CHECK	82 68 (user total count)	CHECK	○
[SIGNAL SIGNAL DOUBLE QUANTITY	↓		
	34 56 (service total count upper figure) 3456XX		○
	↓		
9 (after 1 sec.)	↓ 9 45	No.	○
SET	0		○
1,2	12		○ x 2
SET	12		○
0 (after 1 sec.) SET 3,4 SET	↓ 10 67	No.	○
	0		○
	34 (Total operation time 1234 hours set)		○ x 2
CHECK	.		○

- 5) Practice for cancelling total using times and total operation time (user and service) and all other counter.

■ ... Flashing / ○ ... 0.1sec BUZZER

PAD	DISPLAY	INDICATOR	PHONE
(Door close)	.		
SET	.		
SET	.	No.	○
(within 2.0sec.)	.		
	.		
DOUBLE QUANTITY	.	DOUBLE	○
CHECK	.		
SINGLE	.		
SET	.		○

OTHER SETTING AND CHECKING PROCEDURE

1. EXPRESS DEFROST

$$T = \text{STG1} + \text{STG2} + \text{STG3}$$

$$\text{STG} = A \times T + B$$

- 1) To set the constants of Express defrost.

(Ex. 0.20T, 60% at 1st stage)
 0.15T, 40% at 2nd stage
 0.65T, 20% at 3rd stage)

" " : Flicker / ○ : 0.1 sec BUZZER

PAD ORDER	DISPLAY	PHONE
(Door close)	.	
SET	.	
SET	"NO"	○
(within 2 sec.)	.	
#1 START	.	
EXPRESS DEF	0.00 DEF.	○
2,0	0.20 DEF (A)	○ x 2
#2 SELECT TIME	0 DEF	○
0	0 DEF (+ - B)	○
	DEF	○
SELECT POWER	P -	
	DEF	○
6	P - 60	
SELECT TIME	0.00 DEF	○
1,5	0.15 DEF (A)	○ x 2
SELECT TIME	0 DEF	○
0	0 DEF (+ - B)	○
	DEF	○
SELECT POWER	P -	
	DEF	○
4	P - 40	
SELECT TIME	0 DEF	○
#3 5	5 DEF	○
	DEF	○
SIGNAL	P -	
	DEF	○
2	P - 20	
SET	. DEF	○
SET	.	○

#1 : No key entry signal.

#2 : To set -B, touch the select power key twice.

#3 : Ex. defrost is paused after 50% of cooking time has lapsed when 5 key is entered, otherwise it is paused at the end of each stage.

KEY	DISPLAY	PAUSE
0	0	End of each stage
1	1	After 10% of total cooking time is passed
:	:	:
9	9	After 90% of total cooking time is passed
START	A	There is no pause

- 2) To check the constants of Express defrost.

" " : Flicker / ○ : 0.1 sec BUZZER

PAD	DISPLAY	INDICATOR	PHONE
	.		
CHECK	.	"No." CHECK	○
EXPRESS DEFROST	0.20 (A) 0 (+ - B) ↓ P - 60 (PL) ↓ 0.15 (A) 0 (+ - B) ↓ P - 40 (PL) ↓ 5 (pause time) ↓ P - 20 (PL) ↓ (repeat)	DEF	○
CHECK	.		○

- 3) To set user counts

Practice for inputting total number of using times (Ex. 3100 times), and using times of Memory 1 (Ex. 100 times).

" " : Flicker / ○ : 0.1 sec BUZZER

PAD	DISPLAY	INDICATOR	PHONE
(Door close)	.		
	.		
CHECK	.	CHECK No.	○
CHECK	82 68 (user total count)	CHECK	○
DOUBLE QUANTITY	↓		
SIGNAL	0		○
SET	0		○
3,1,0,0	31 00		○ x 4
SET	31 00 (user total count 3100 set)		○
#A 1	1	No.	○
(after 1 sec.)	1 32 (memory 1 count)		
SET	0		○
1,0,0	1 00		○ x 3
SET	1 00 (memory 1 count 100 set)		○
CHECK	↓		○

NOTE:

- 1 : To input using times of other memory, touch necessary Memory key at above step #A.
- 2 : To input using times of manual cooking, touch SELECT TIME key at above step #A.
- 3 : To input using times of Express Defrost, touch EXPRESS DEFROST key at above step #A.

COMPONENT REPLACEMENT AND ADJUSTMENT PROCEDURE

WARNING: Avoid possible exposure to microwave energy. Please follow the instructions below before operating the oven.

1. Disconnect the oven from power supply.
2. Visually check the door and cavity face plate for damage (dents, cracks, signs of arcing etc.).

Carry out any remedial work that is necessary before operating the oven.

Do not operate the oven if any of the following conditions exist;

1. Door does not close firmly.
2. Door hinge, support or latch hook is damaged.
3. The door gasket or seal is damaged.

4. The door is bent or warped.
5. There are defective parts in the door interlock system.
6. There are defective parts in the microwave generating and transmission assembly.
7. There is visible damage to the oven.

Do not operate the oven:

1. Without the RF gasket (Magnetron).
2. If the wave guide or oven cavity are not intact.
3. If the door is not closed.
4. If the outer case (cabinet) is not fitted.

Please refer to 'OVEN PARTS, CABINET PARTS, CONTROL PANEL PARTS, DOOR PARTS', when carrying out any of the following removal procedures:

OUTER CASE REMOVAL

To remove the outer case, proceed as follows.

1. Disconnect oven from power supply.
2. Open the oven door and wedge it open.
3. Remove the five (5) screws from rear and along the side edge of case.
4. Slide the entire case back about 3cm to free it from retaining clips on the cavity face plate.
5. Lift the entire case from the oven.
6. Discharge the H.V. capacitor before carrying out any

further work.

7. Do not operate the oven with the outer case removed.
- N.B.; Step 1, 2 and 8 form the basis of the 3D checks.

CAUTION: 1. DISCONNECT OVEN FROM POWER SUPPLY BEFORE REMOVING OUTER CASE.
2. DISCHARGE THE HIGH VOLTAGE CAPACITOR BEFORE TOUCHING ANY OVEN COMPONENTS OR WIRING.

HIGH VOLTAGE TRANSFORMER REMOVAL

1. CARRY OUT 3D CHECKS.
2. Disconnect the filament leads of high voltage transformer from high voltage capacitor and the magnetron.
3. Disconnect the H.V. fuse from the high voltage transformer.
4. Disconnect the main wire harness from the high volt-

age transformer.

5. Remove the four (4) screws holding the transformer to base plate.
6. Remove the transformer.
7. Now the high voltage transformer is free.

HIGH VOLTAGE CAPACITOR, HIGH VOLTAGE FUSE AND HIGH VOLTAGE RECTIFIER ASSEMBLY REMOVAL

To remove the components, proceed as follows.

1. CARRY OUT 3D CHECKS.
2. Disconnect H.V. wire of the high voltage rectifier assembly from the magnetron.
3. Disconnect the filament lead of the high voltage transformer from the high voltage capacitor.
4. Remove one (1) screw holding earth side terminal of the high voltage rectifier assembly.
5. Disconnect high voltage fuse and terminal of high voltage rectifier assembly from the high voltage capacitor.
6. Now, the high voltage rectifier assembly should be free.
7. Disconnect the high voltage fuse from the high voltage transformer.

8. Now, the high voltage fuse is free.
9. Remove one (1) screw holding the capacitor holder to the oven cavity rear plate.
10. Remove one (1) screw holding the fan duct to the oven cavity rear plate.
11. Release the capacitor holder from the fan duct.
12. Remove the capacitor from the capacitor holder.
13. Now, the capacitor should be free.

CAUTION: WHEN REPLACING HIGH VOLTAGE RECTIFIER ASSEMBLY, ENSURE THAT THE CATHODE (EARTH) CONNECTION IS SECURELY FIXED TO THE CAPACITOR HOLDER AND OVEN CAVITY REAR PLATE WITH AN EARTHING SCREW.

MAGNETRON REMOVAL

1. CARRY OUT 3D CHECKS.
2. Disconnect the high voltage wire of the high voltage

rectifier assembly and filament lead of the transformer from the magnetron.

3. Remove the one (1) screw holding the air guide to the magnetron and remove the air guide.
4. Remove the one (1) screw holding the chassis support to the magnetron.
5. Carefully remove four (4) screws holding magnetron to waveguide, when removing the screws hold the magnetron to prevent it from falling.
6. Remove the magnetron from the waveguide with care so the magnetron antenna is not hit by any metal object around the antenna.

CAUTION: WHEN REPLACING THE MAGNETRON, BE SURE THE R.F. GASKET IS IN PLACE AND THE MAGNETRON MOUNTING SCREWS ARE TIGHTENED SECURELY.

CONTROL PANEL ASSEMBLY REMOVAL

CONTROL PANEL ASSEMBLY

1. CARRY OUT 3D CHECKS.
2. Disconnect the main wire harness from the control unit.
3. Remove the one (1) screw holding the control panel assembly to the oven cavity front plate.
4. Lift up the control panel assembly.
5. Now, the control panel assembly is free.

CONTROL UNIT

6. Disconnect the flat ribbon cable from the connector CNG.
7. Remove the six (6) screws holding the control unit to the control panel frame.
8. Release the two (2) tabs of the control panel frame

holding the control unit to the control panel frame.

9. Now, the control unit is free.

NOTE: 1. Before attaching a new key unit, wipe off remaining adhesive on the control panel frame surfaces completely with a soft cloth soaked in alcohol.

2. When attaching the key unit to the control panel frame, adjust the upper edge and right edge of the key unit to the correct position of control panel frame.

3. Stick the key unit firmly to the control panel frame by rubbing with a soft cloth so not to cause scratches.

OVEN LAMP AND LAMP SOCKET REMOVAL

1. CARRY OUT 3D CHECKS.
2. Screw the oven lamp from the oven lamp socket off.
3. Now, the oven lamp is free.
4. Lift up the oven lamp socket from air intake duct.
5. Pull the wire leads from the oven lamp socket by pushing the terminal hole of the oven lamp socket with the small flat type screw driver.
6. Now, the oven lamp socket is free.

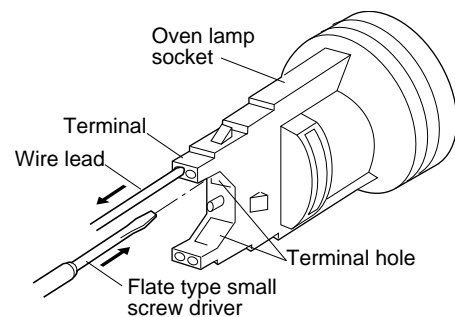


Figure C-1. Oven lamp socket

POSITIVE LOCK® CONNECTOR (NO-CASE TYPE) REMOVAL

1. CARRY OUT 3D CHECKS.
2. Push the lever of positive lock® connector.
3. Pull down on the positive lock® connector.

CAUTION: WHEN CONNECTING THE POSITIVE LOCK® CONNECTORS TO THE TERMINALS, INSTALL THE POSITIVE LOCK® CONNECTOR SO THAT THE LEVER FACES YOU

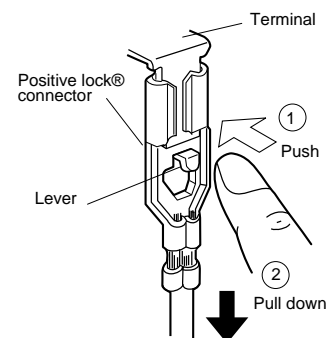


Figure C-2 Positive lock® connector

ANTENNA MOTOR REMOVAL

1. Disconnect the oven from the power supply.
2. Remove the one (1) screw holding the base plate cover to the base plate and remove the base plate cover.
3. Disconnect the wire leads from the antenna motor and
- remove the one (1) screw holding the antenna motor.
4. Remove the antenna motor shaft from the antenna motor.
5. Now, the antenna motor is free.

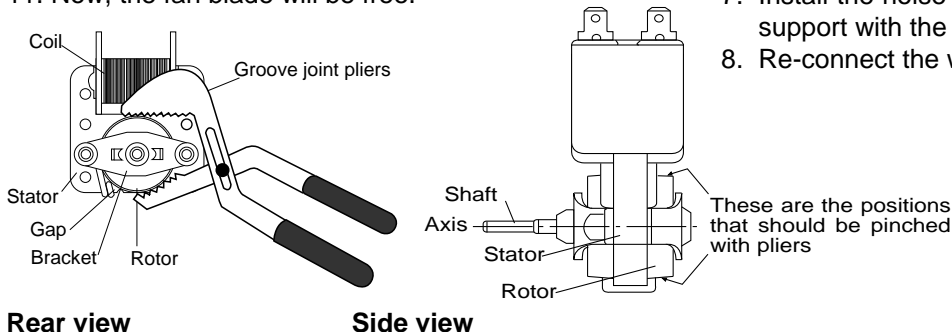
FAN MOTOR REPLACEMENT

REMOVAL

1. CARRY OUT 3D CHECKS.
2. Remove the one (1) screw holding the noise filter to the chassis support.
3. Release the noise filter from the tab on the fan duct.
4. Disconnect the wire leads from the fan motor.
5. Remove the one (1) screw holding the capacitor holder to the oven cavity rear plate.
6. Remove the one (1) screw holding the fan duct to the oven cavity rear plate.
7. Remove the fan duct from the oven.
8. Remove the fan blade from the fan motor shaft according to the following procedure.
9. Hold the edge of the rotor of the fan motor by using a pair of groove joint pliers.

CAUTION:

- * **Make sure that no metal pieces enter the gap between the rotor and the stator of the fan motor because the rotor is easily shaven by pliers and metal pieces may be produced.**
 - * **Do not touch the pliers to the coil of the fan motor because the coil may be cut or injured.**
 - * **Do not disfigure the bracket by touching with the pliers.**
10. Remove the fan blade from the shaft of the fan motor by pulling and rotating the fan blade with your hand.
 11. Now, the fan blade will be free.



CAUTION:

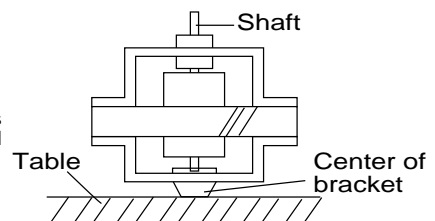
- * **Do not reuse the removed fan blade because the hole (for shaft) may be larger than normal.**
12. Remove the two (2) screws holding the fan motor to the fan duct.
 13. Now, the fan motor is free.

INSTALLATION

1. Install the fan motor to the fan duct with the two (2) screws.
2. Install the fan blade to the fan motor shaft according to the following procedure.
3. Hold the center of the bracket which supports the shaft of the fan motor on the flat table.
4. Install the fan blade to the shaft of fan motor by pushing the fan blade with a small, light weight, ball peen hammer or rubber mallet.

CAUTION:

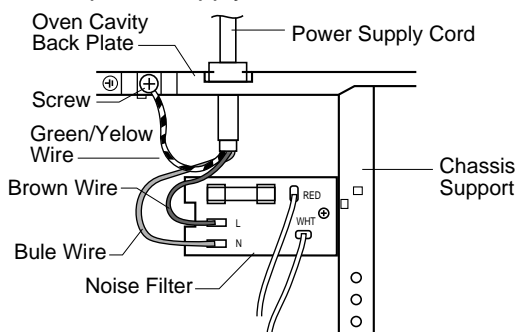
- * **Do not hit the fan blade hard when installing because the bracket may be disfigured.**
 - * **Make sure that the fan blade rotates smooth after installation.**
 - * **Make sure that the axis of the shaft is not slanted.**
5. Install the fan duct to the oven cavity rear plate with the one (1) screw.
 6. Install the capacitor holder to the oven cavity rear plate with the one (1) screw.
 7. Install the noise filter to the fan duct and the chassis support with the one (1) screw.
 8. Re-connect the wire leads to the fan motor.



POWER SUPPLY CORD REPLACEMENT

Removal

1. CARRY OUT 3D CHECKS.
2. Remove the one (1) screw holding the green/yellow wire to the cavity rear plate.
3. Disconnect the leads of the power supply cord from the noise filter, referring to the Figure C-3(a).
4. Release the power supply cord from the oven cavity rear plate.
5. Now, the power supply cord is free.



Re-install

1. Insert the moulding cord stopper of power supply cord into the square hole of the oven cavity rear plate, referring to the Figure C-3(b).
2. Install the earth wire lead of power supply cord to the cavity rear plate with one (1) screw and tight the screw.
3. Connect the brown and blue wire leads of power supply cord to the noise filter correctly, referring to the Pictorial Diagram.

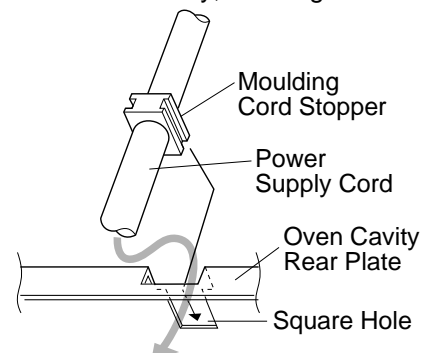


Figure C-3 (a) Replacement of Power Supply Cord

Figure C-3(b). Power Supply Cord Replacement

1ST. INTERLOCK SWITCH, LATCH SWITCH, 2ND. INTERLOCK RELAY CONTROL SWITCH, AND MONITOR SWITCH REMOVAL

1. CARRY OUT 3D CHECKS.
2. Remove the control panel assembly referring to "CONTROL PANEL ASSEMBLY REMOVAL".
3. Disconnect the leads from all switches.
4. Remove the two (2) screws holding the latch hook to the oven cavity.
5. Remove the latch hook.
6. Push the retaining tab outward slightly and remove the switch.

Re-install

1. Re-install each switch in its place. The 2nd. interlock relay control switch and the latch switch are in the lower position and the 1st. interlock switch is in the upper position. The monitor switch is in the middle position.
2. Re-connect wire leads to each switch.
Refer to pictorial diagram.
3. Secure latch hook (with two (2) mounting screws) to oven flange.

4. Make sure that the monitor switch is operating properly and check continuity of the monitor circuit. Refer to chapter "Test Procedure" and Adjustment procedure.

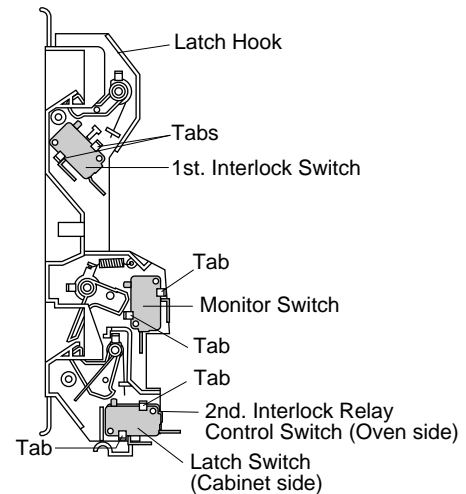


Figure C-4. Switches

1ST. INTERLOCK SWITCH, LATCH SWITCH, 2ND. INTERLOCK RELAY CONTROL SWITCH, AND MONITOR SWITCH ADJUSTMENT

If the 1st. interlock switch, latch switch, 2nd. interlock relay control switch and monitor switch do not operate properly due to a mis-adjustment, the following adjustment should be made.

1. CARRY OUT 3D CHECKS.
2. Loosen the two (2) screws holding the latch hook to the oven cavity front flange.
3. With door closed, adjust latch hook by moving it back and forth, and up and down. In and out play of the door allowed by the upper and lower position of the latch hook should be less than 0.5mm. The vertical position of the latch hook should be adjusted so that the 1st. interlock switch, latch switch and 2nd. interlock relay control switch are activated with the door closed. The horizontal position of the latch hook should be adjusted so that the plunger of the monitor switch is pressed with the door closed.
4. Secure the screws with washers firmly.
5. Check the operation of all switches. If each switch has not activated with the door closed, loosen screw and adjust the latch hook position.

After adjustment, check the following.

1. In and out play of door remains less than 0.5mm when in the latched position. First check upper position of latch hook, pushing and pulling upper portion of door toward the oven face. Then check lower portion of the latch hook, pushing and pulling lower portion of the

door toward the oven face. Both results (play in the door) should be less than 0.5mm.

2. The 1st. interlock switch, latch switch and 2nd. interlock relay control switch interrupt the circuit before the door can be opened.
3. Monitor switch contacts close when door is opened.
4. Re-install outer case and check for microwave leakage around door with an approved microwave survey meter. (Refer to Microwave Measurement Procedure.)

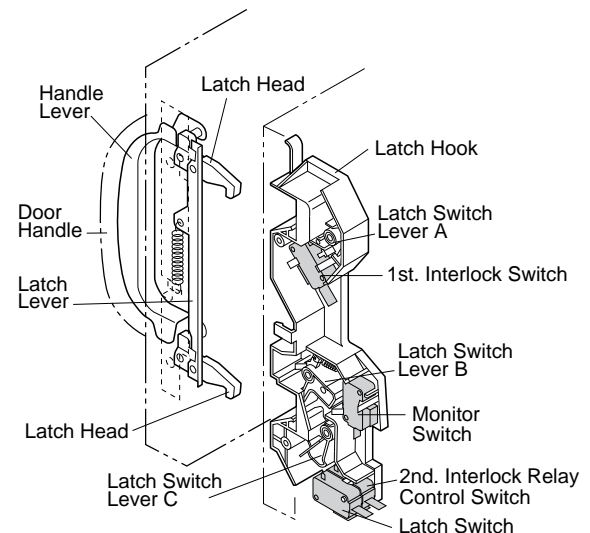


Figure C-5. Latch Switch Adjustments

DOOR PARTS REPLACEMENT

CHOKE COVER

1. Disconnect the oven from the power supply.
2. Open the oven door and wedge it open.
3. Insert a putty knife (thickness of about 0.5mm) into the

gap between the choke cover and door frame as shown in Figure C-6 to free engaging parts.

4. Pry the choke cover by inserting a putty knife as shown in Figure C-6.

5. Release choke cover from door panel.
6. Now choke cover is free.

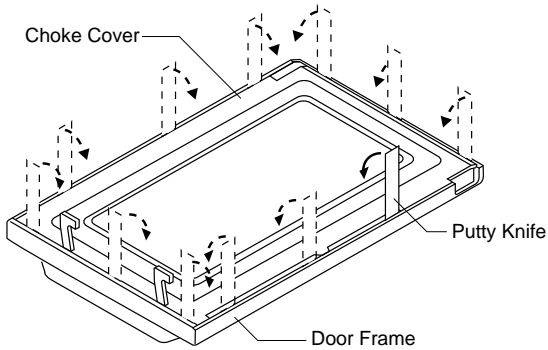


Figure C-6. Door Disassembly

7. Release two (2) pins of door panel from two (2) holes of upper and lower oven hinges by lifting up.
8. Now, door sub assembly is free from oven cavity.

DOOR PANEL REMOVAL

9. Remove the four (4) screws holding the door panel to the door frame.
10. Release door panel from seven (7) tabs of door frame by sliding door panel downward.
11. Now, the door panel is free.

DOOR HANDLE REMOVAL

12. Release the latch spring from the tab of the latch angle assembly.
13. Remove the two (2) screws holding the door handle and the latch angle assembly through the door frame.
14. Now, door handle is free.

LATCH HEADS REMOVAL

15. Remove the one (1) screw holding the latch angle assembly to the door frame.
16. Remove the latch angle assembly together with the latch lever, latch spring and the upper and lower latch heads from the door frame.
17. Release the latch lever together with the latch spring and the latch heads from the latch angle assembly.
18. Release the two (2) latch heads from the latch lever.
19. Now, the upper and lower latch heads are free.

FRONT DOOR GLASS REMOVAL

(After DOOR PANEL REMOVAL)

12. Remove the four (4) screws holding the glass stopper U to the door frame and remove the glass stopper U.
13. Remove the two (2) screws holding the glass stopper R to the door frame and remove the glass stopper R.
14. Slide the front door glass left at first and then slide upwards to release it from the tabs holding it.
17. Now, the front door glass is free

DOOR CASE REMOVAL

(After DOOR PANEL REMOVAL)

12. Straighten all tabs of the door case holding the door case to the door frame.
13. Release door case from the door frame.
17. Now, the door case is free

NOTE: At this moment, the door badge is attached on the door case.

RE-INSTALL OF THE DOOR

1. Re-install all door parts except the choke cover.
2. Catch two (2) pins of door panel on two (2) holes of upper and lower oven hinges.
3. Re-install choke cover to door panel by pushing.

NOTE: After any service to the door;

- (A) Make sure that door sensing switch and secondary interlock switch are operating properly. (Refer to chapter "Test Procedures".)
- (B) An approved microwave survey meter should be used to assure compliance with proper microwave radiation emission limitation standards. (Refer to Microwave Measurement Procedure.)

After any service, make sure of the following :

1. Door latch heads smoothly catch latch hook through latch holes and that latch head goes through center of latch hole.
2. Deviation of door alignment from horizontal line of cavity face plate is to be less than 1.0mm.
3. Door is positioned with its face pressed toward cavity face plate.
4. Check for microwave leakage around door with an approved microwave survey meter. (Refer to Microwave Measurement Procedure.)

Note: The door on a microwave oven is designed to act as an electronic seal preventing the leakage of microwave energy from oven cavity during cook cycle. This function does not require that the door be airtight, moisture (condensation)-tight or light-tight. Therefore, occasional appearance of moisture, light or sensing of gentle warm air movement around oven door is not abnormal and do not in themselves indicate a leakage of microwave energy from oven cavity.

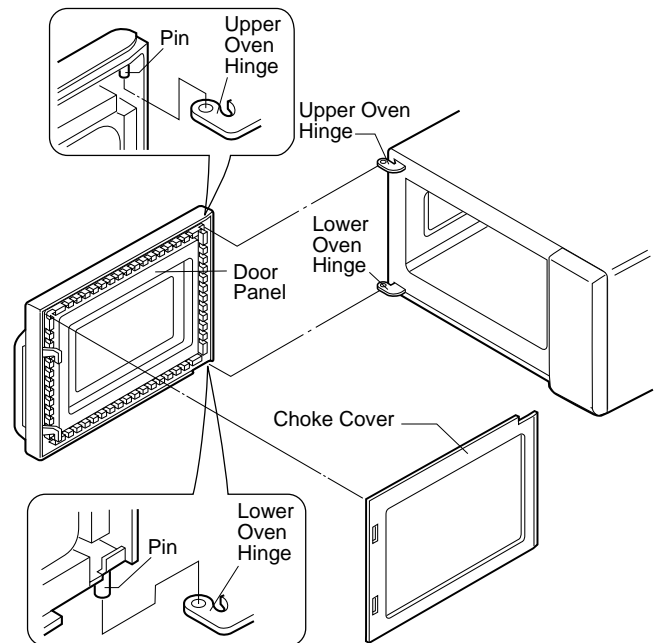


Figure C-7. Door Replacement

INSTALLATION OF CERAMIC SHELF

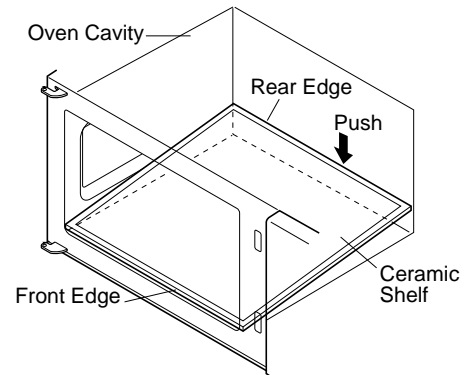
1. Disconnect the oven from the power supply.
2. Open the oven door and wedge it open.
3. Make sure that the smooth surface of the ceramic shelf face up.
4. Make sure that the rubber packing without a fin of the ceramic shelf faces the front of the oven.

NOTE: The three (3) rubber packings with the fins and the one (1) rubber packing without a fin are attached to the four (4) edges of the ceramic shelf. The one (1) rubber packing without a fin is the front edge of the ceramic shelf.

5. Put the front edge of the ceramic shelf into the front edge of the oven cavity bottom plate.
6. Push down the rear edge of the ceramic shelf into the oven cavity bottom plate.
7. Now, the ceramic shelf is installed.

WARNING

Make sure that the rubber packing is not caught between the oven door and the oven cavity front plate, to avoid possible exposure to excessive microwave energy.



MICROWAVE MEASUREMENT

After any repair, the microwave oven must be checked for microwave leakage to ensure continued safe operation. BS EN 60335-2-25 specifies that the maximum permitted leakage with a load of 275 ml is 50 W/m² (equivalent to 5 mW/cm²) at a distance of 5 cm from the oven.

PREPARATION

The following items are required to carry out this test:-

1. A low form of 600 ml beaker made from an electrically non-conductive material, such as glass or plastic, with an inside diameter of approximately 8.5 cm. This must contain 275 ± 15 ml of water, at an initial temperature of 20 ± 2°C.
2. A leakage detector which has been calibrated within the preceding 12 months to a stand whose accuracy can be traced to National Physical Laboratory Standards.

Recommended instruments are:

Apollo "XI"

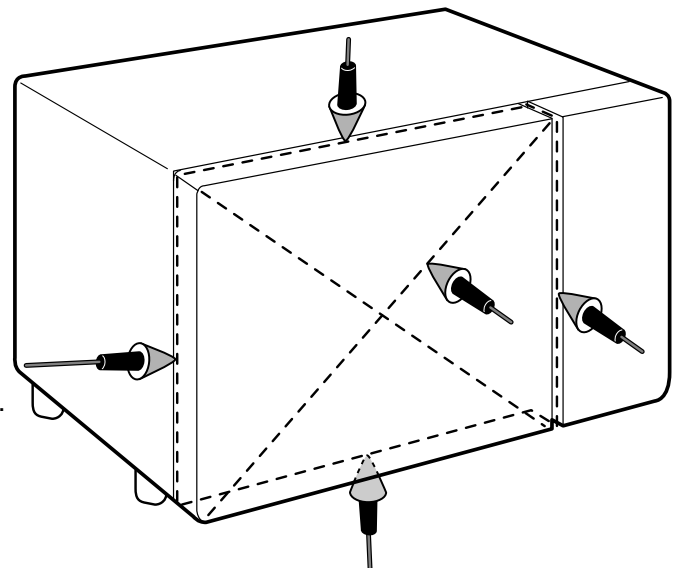
Celtec "A100"

Before commencing the test, check that the leakage detector is functioning and adjusted according to the manufacturer's instructions, and any spacers are fitted to ensure that measurement is taken 5cm from the surface of the oven.

Dotted line indicates the path taken by the leakage detector.

PROCEDURE

1. Place the beaker containing the water load in the oven cavity at the centre of the turntable. The placing of this standard load in the oven is important, not only to protect the oven, but also to ensure that any leakage it is not disguised by too large a load absorbing energy.
2. Close the oven door, and with the power level set to FULL, turn the oven ON with the timer set for a few minutes operation. Should the water begin to boil before the test has been completed, it should be replaced.
3. As shown in the diagram below, move the probe slowly (not faster than 2.5 cm/sec.);-
 - a) around the edge of the door following the gap
 - b) across the face of the door
 - c) across any vents in the oven's sides, rear or top




Whilst the maximum leakage permitted in BS EN 60335-2-25 is 50 W/m² (equivalent to 5 mW/cm²), it is not normal to detect any significant leakage, and therefore any detected leakage should be investigated.

SCHEMATIC

NOTE: CONDITION OF OVEN

1. DOOR CLOSED.

2.  APPEAR ON DISPLAY.

NOTE: ★ Indicates components with potential above 250 V.

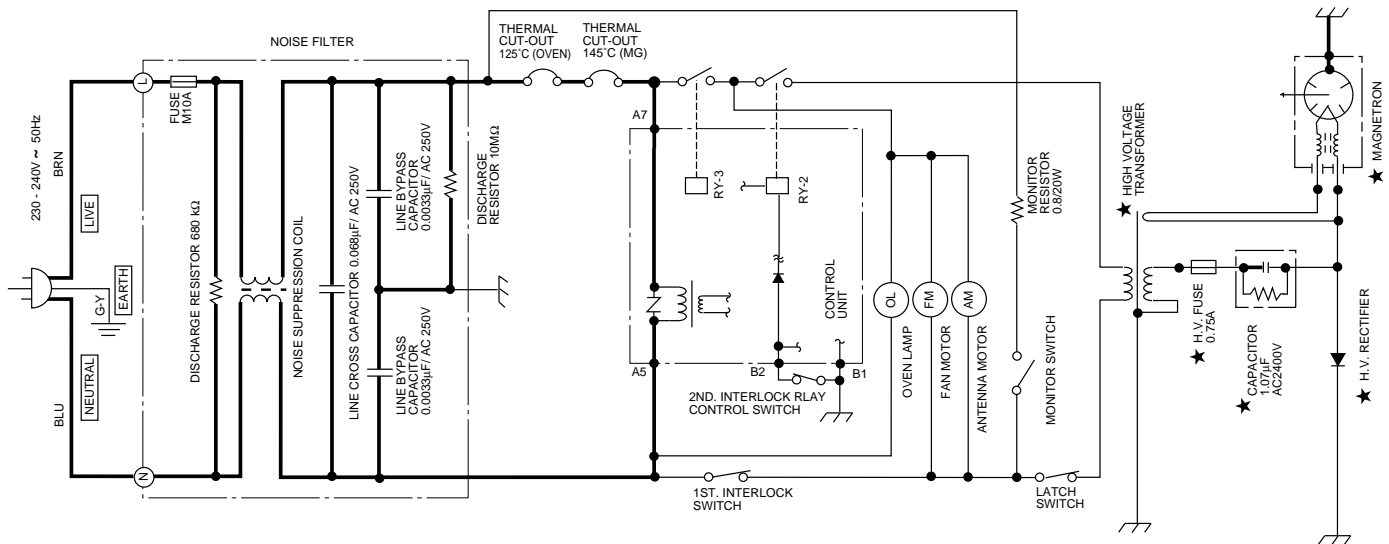


Figure O-1 Oven Schematic-OFF Condition

SCHEMATIC

NOTE: CONDITION OF OVEN

1. DOOR CLOSED.

2. "SELECT TIME" PAD TOUCHED.

3. COOKING TIME ENTERED.

4. START PAD TOUCHED.

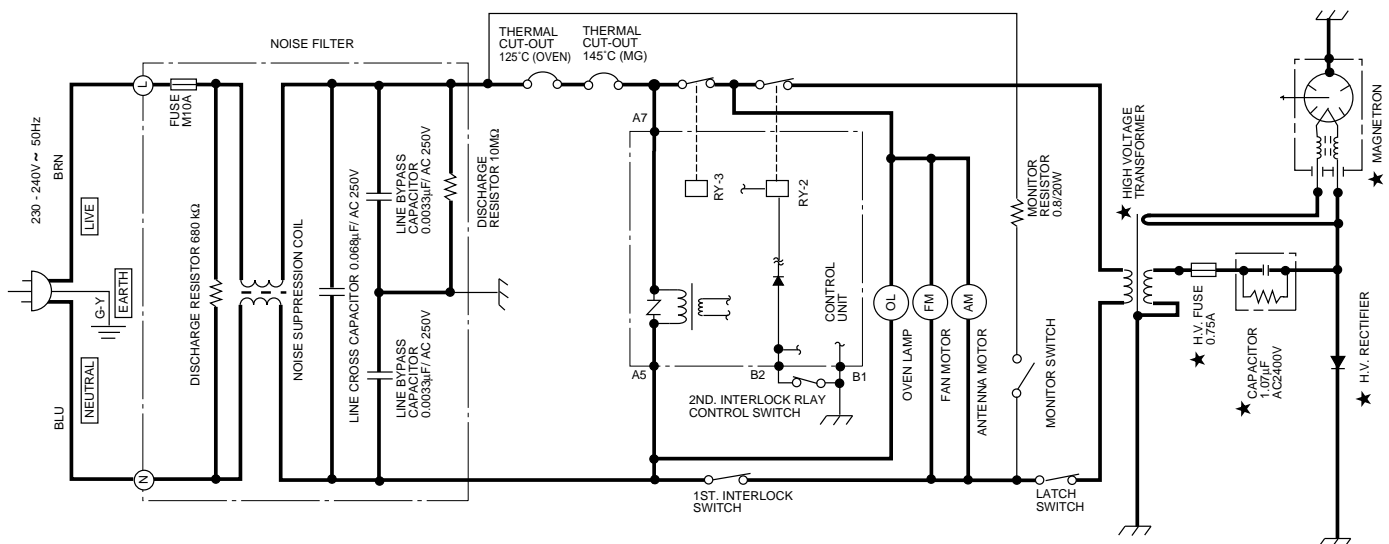


Figure O-2 Oven Schematic-Cooking Condition

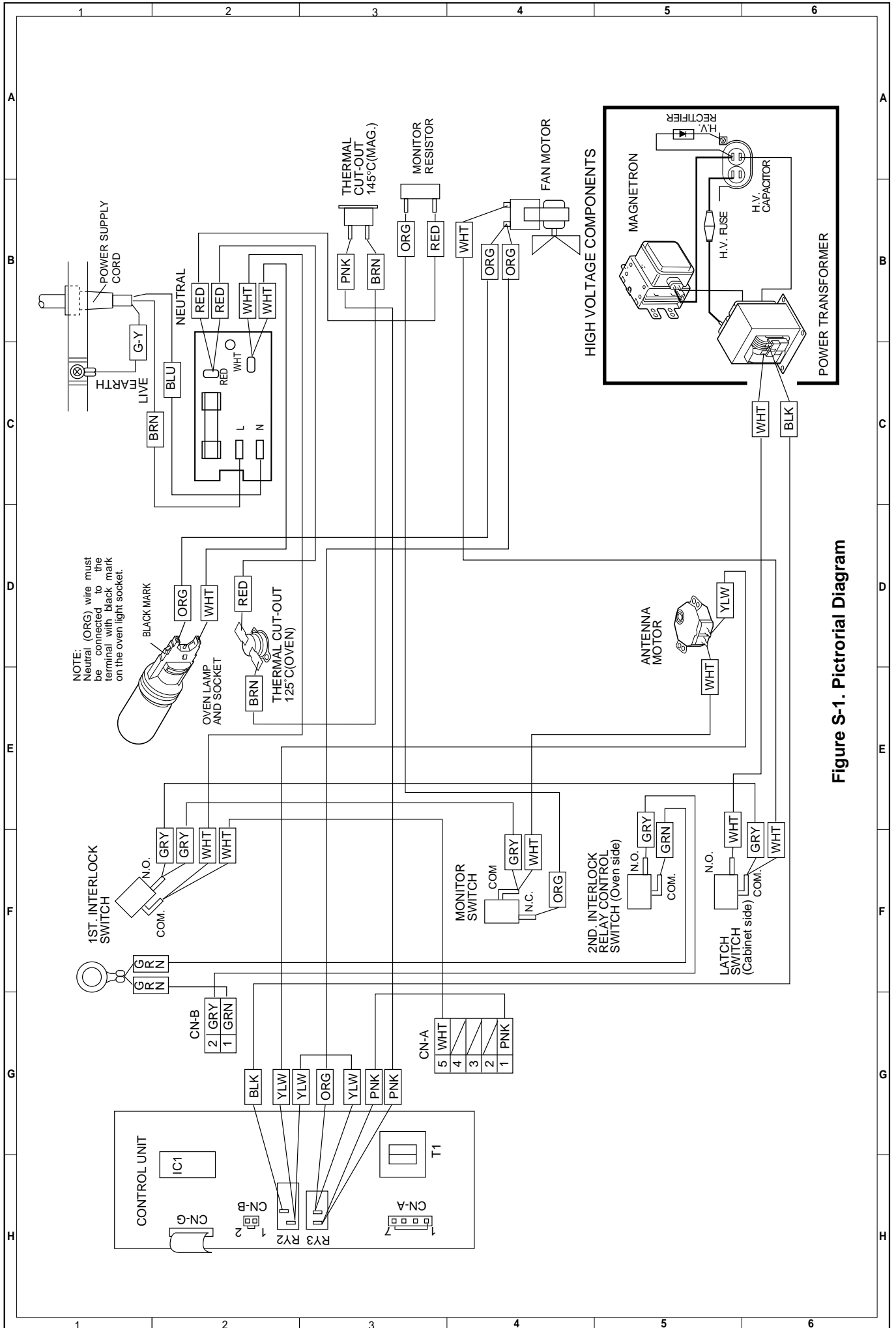
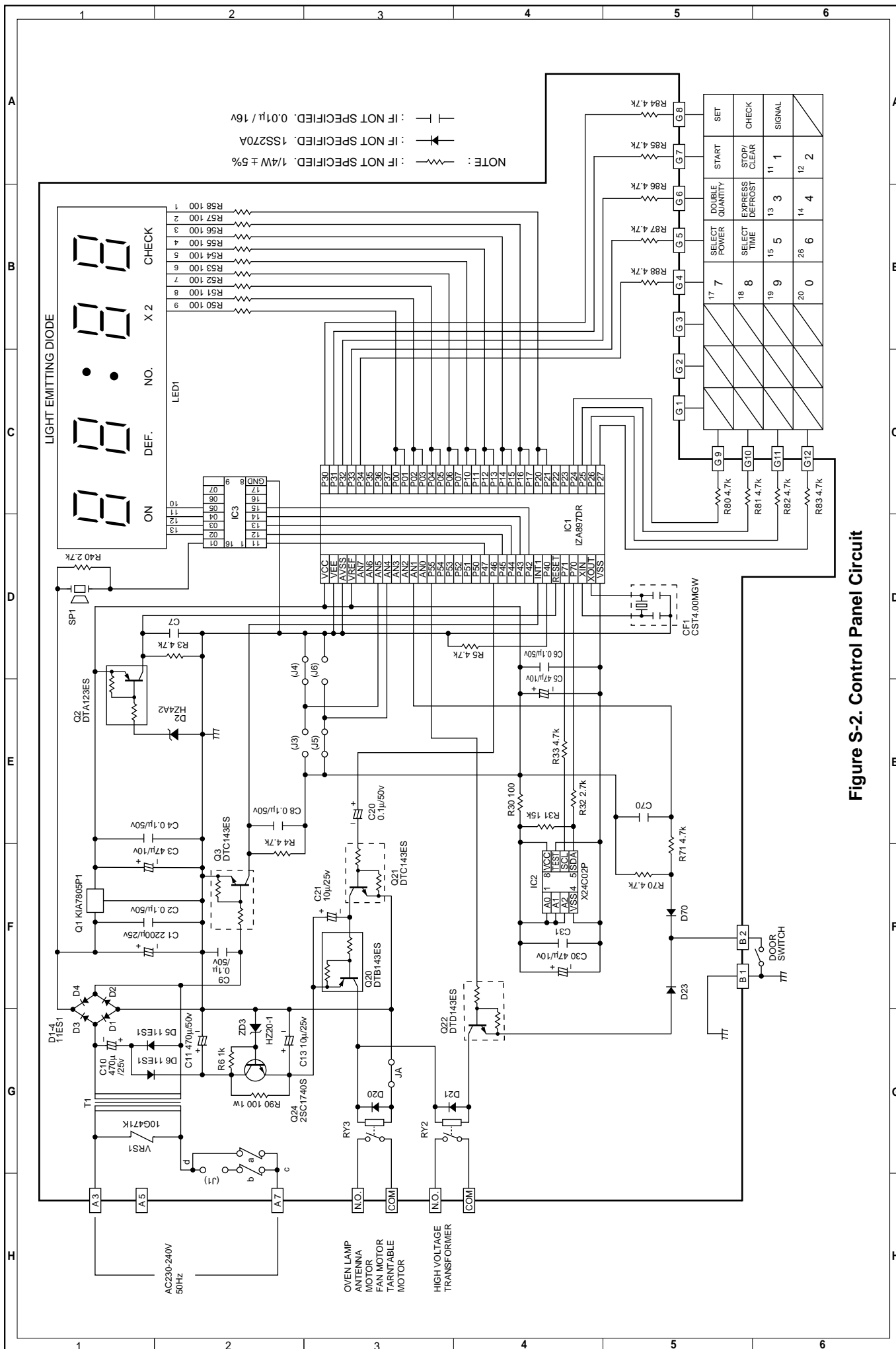
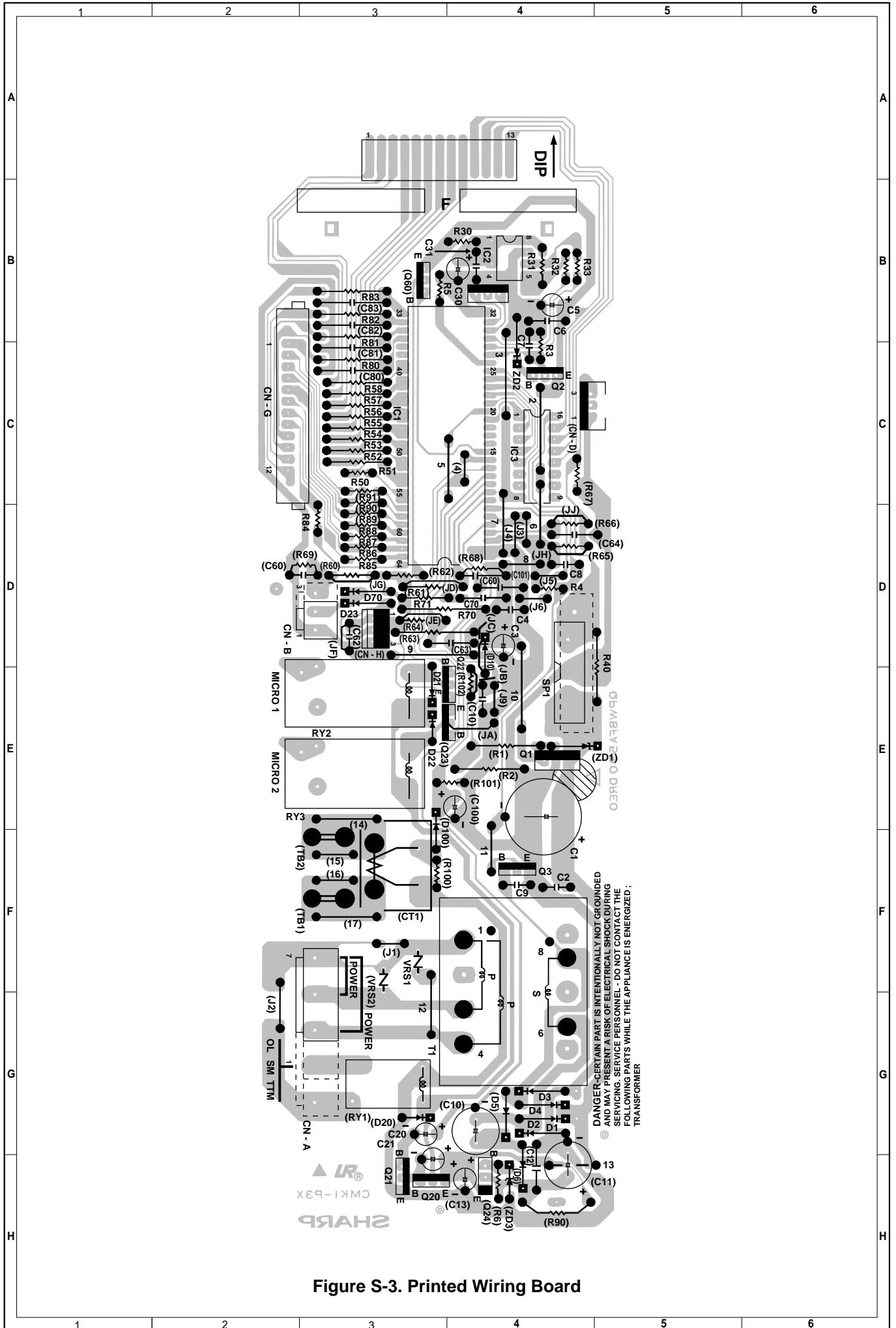


Figure S-1. Pictorial Diagram





PARTS LIST

Note: The parts marked "Δ" may cause undue microwave exposure.

The parts marked "*" are used in voltage more than 250V.

REF. NO.	PART NO.	DESCRIPTION	Q'TY	CODE
----------	----------	-------------	------	------

ELECTRIC PARTS

1- 1	QSW-MA086WRE0	Monitor switch	1	AF
1- 2	QSW-MA085WRE0	2nd. interlock relay control switch	1	AF
1- 3	QSW-MA095WRE0	1st. interlock switch and latch switch	2	AF
1- 4	QACC-A088WRE0	Power supply cord	1	AW
* 1- 5	FH-DZA086WRK0	High voltage rectifier assembly	1	AT
* 1- 6	RC-QZA247WRE0	High voltage capacitor	1	BE
* 1- 7	RMOTEA378WRE0	Fan motor	1	AU
1- 8	RR-WZA022WRE0	Monitor resistor 0.8 ohm 20 W	1	AK
1- 9	QSOCLA022WRE0	Oven lamp socket	1	AG
1-10	RLMPTA069WRE0	Oven lamp	1	AK
1-11	RMOTDA234WRE0	Antenna motor	1	AR
1-12	RTHM-A080WRE0	Thermal cut-out 145 deg. (MAG)	1	AP
1-13	RTHM-A096WRE0	Thermal cut-out 125 deg. (OVEN)	1	AK
* 1-14	RTRN-A574WRE0	High voltage transformer	1	BQ
Δ* 1-15	RV-MZA197WRE0	Magnetron	1	BN
* 1-16	QFS-IA002WRE0	High voltage fuse	1	AQ
1-17	QFS-CQ001YBE0	Fuse 10A	1	AE
1-18	FPWBFA325WRK0	Noise filter	1	AT

CABINET PARTS

2- 1	GCABUA672WRP0	Outer case cabinet	1	BH
2- 2	GDAI-A318WRW0	Base plate	1	AV
2- 3	GCOVHA406WRW0	Base plate cover	1	AQ
2- 4	GLEGPA074WRE0	Foot	2	AC
2- 5	GLEGPA076WRF0	Leg	1	AF

CONTROL PANEL PARTS

3- 1	CPWBFA819WRK0	Control unit	1	BL
3- 1A	QCNCMA234DRE0	3-pin connector (A)	1	AC
3- 1B	QCNCMA275DRE0	2-pin connector (B)	1	AB
3- 1C	QCNCWA057DRE0	12-pin connector (G)	1	AF
C1	VCEAB51EW228M	Capacitor 2200 uF 25V	1	AE
C2	RC-KZA087DRE0	Capacitor 0.1 uF 50V	1	AA
C3	VCEAB31AW476M	Capacitor 47 uF 10V	1	AA
C4	RC-KZA087DRE0	Capacitor 0.1 uF 50V	1	AA
C5	VCEAB31AW476M	Capacitor 47 uF 10V	1	AA
C6	RC-KZA087DRE0	Capacitor 0.1 uF 50V	1	AA
C7	VCKYD11CY103N	Capacitor 0.01 uF 16V	1	AA
C8-9	RC-KZA087DRE0	Capacitor 0.1 uF 50V	2	AA
C10	VCEAB31EW477M	Capacitor 470 uF 25V	1	AC
C11	VCEAB31HW477M	Capacitor 470 uF 50V	1	AE
C13	VCEAB31EW106M	Capacitor 10 uF 25V	1	AA
C20	VCEAB31HW104M	Capacitor 0.1 uF 50V	1	AM
C21	VCEAB31EW106M	Capacitor 10 uF 25V	1	AA
C30	VCEAB31AW476M	Capacitor 47 uF 10V	1	AA
C31	VCKYD11CY103N	Capacitor 0.01 uF 16V	1	AA
C70	VCKYD11CY103N	Capacitor 0.01 uF 16V	1	AA
CF1	RCRS-A012DRE0	Ceramic resonator CST4.00MGW	1	AD
D1-6	VHD11ES1///-1	Diode (11ES1)	6	AB
D20-21	VHD1SS270A/-1	Diode (1SS270A)	2	AA
D23	VHD1SS270A/-1	Diode (1SS270A)	1	AA
D70	VHD1SS270A/-1	Diode (1SS270A)	1	AA
IC1	RH-IZA897DRE0	LSI	1	AV
IC2	RH-IZA521DRE0	IC (X24C02P)	1	AL
IC3	RIC--A025BDE0	IC (KID65004AP)	1	AE
LED1	VHPSL3966T/1B	Light emitting diode	1	AS
Q1	RIC--A022BDE0	IC (KIA7805P1)	1	AE
Q2	VSDTA123ES/-3	Transistor (DTA123ES)	1	AA
Q3	VSDTA143ES/-3	Transistor (DTA143ES)	1	AB
Q20	VSDTB143ES/-3	Transistor (DTB143ES)	1	AC
Q21	VSDTA143ES/-3	Transistor (DTA143ES)	1	AB
Q22	VSDTD143ES/-3	Transistor (DTD143ES)	1	AC
Q24	VS2SC1740S/-3	Transistor (2SC1740)	1	AB
R3-5	VRD-B12EF472J	Resistor 4.7k ohm 1/4W	3	AA
R6	VRD-B12EF102J	Resistor 1k ohm 1/4W	1	AA
R30	VRD-B12EF101J	Resistor 100 ohm 1/4W	1	AA
R31	VRD-B12EF153J	Resistor 15k ohm 1/4W	1	AA
R32	VRD-B12EF272J	Resistor 2.7k ohm 1/4W	1	AA
R33	VRD-B12EF472J	Resistor 4.7k ohm 1/4W	1	AA
R40	VRD-B12EF272J	Resistor 2.7k ohm 1/4W	1	AA
R50-58	VRD-B12EF101J	Resistor 100 ohm 1/4W	9	AA
R70-71	VRD-B12EF472J	Resistor 4.7 ohm 1/4W	2	AA
R80-88	VRD-B12EF472J	Resistor 4.7 ohm 1/4W	9	AA

Note: The parts marked "Δ" may cause undue microwave exposure.
The parts marked "*" are used in voltage more than 250V.

REF. NO.	PART NO.	DESCRIPTION	Q'TY	CODE
R90	VRS-B13AA101J	Resistor 100 ohm 1W	1	AA
RY2	RRLY-A092DRE0	Relay (VRB18SP)	1	AL
RY3	RRLY-A093DRE0	Relay (VRB18)	1	AL
SP1	RALM-A014DRE0	Buzzer (PKM22EPT)	1	AG
T1	RTRNPA131DRE0	Touch control transformer	1	AR
VRS1	RH-VZA032DRE0	Varistor (10G471K)	1	AE
ZD2	VHEHZ4A2///-1	Zener diode (HZ4A2)	1	AA
ZD3	VHEHZ201///-1	Zener diode (HZ20-1)	1	AA
3- 2	FPNLCB403WRK0	Control panel frame with key unit	1	BB
3- 2-1	FUNTKA899WRE0	Key unit	1	AV
3- 2-2	GCOVAA260WRP0	C/P case	1	BA
3- 2-3	GMADIA109WRF0	Display window	1	AE
3- 3	XEPSD30P08XS0	Screw; 3mm x 8mm	6	AA

OVEN PARTS

Δ	4- 1	FGLSPA062WRE0	Ceramic shelf	1	BL
Δ	4- 2	DOVN-A514WRY0	Oven cavity	1	BU
Δ	4- 3	MLEVPA227WRF0	Latch switch lever A	1	AF
Δ	4- 4	MLEVPA228WRF0	Latch switch lever B	1	AF
Δ	4- 5	MLEVPA229WRF0	Latch switch lever C	1	AF
Δ	4- 6	MSPRCA108WRE0	Latch lever spring	3	AC
Δ	4- 7	MSPRTA191WRE0	Switch lever B spring	1	AC
Δ	4- 8	PHOK-A107WRF0	Latch hook	1	AL
Δ	4- 9	FDUC-A341WRY0	Steam duct sub assembly	1	BL
Δ	4-10	PSKR-A351WRP0	Steam guide	1	AY
Δ	4-11	LBNDKA139WRW0	HV capacitor holder	1	AR
Δ	4-12	NFANJA029WRE0	Fan blade	1	AK
Δ	4-13	PDUC-A697WRF0	Fan duct	1	AM
Δ	4-14	FPLT-A007WRY0	Stirrer antenna assembly	1	BB
Δ	4-15	PCUSUA507WRP0	Cushion	1	AC
Δ	4-16	PCUSGA378WRP0	Cushion	1	AL
Δ	4-17	PSPA-A112WRE0	Mica washer	1	AC
Δ	4-18	LANGFA187WRP0	Chassis support	1	AL
Δ	4-19	NSFTPA033WRF0	Antenna motor shaft	1	AK
Δ	4-20	PSKR-A359WRW0	Air guide	1	AM
Δ	4-21	PSKR-A349WRP0	Steam duct barrier	1	AF
Δ	4-22	PFILWA060WRP0	Lamp filter	1	AD
Δ	4-23	PDUC-A722WRF0	Air intake duct	1	AF
Δ	4-24	PCUSGA249WRP0	Cushion	1	AA
Δ	4-25	PCUSUA235WRP0	Cushion	1	AE
Δ	4-26	PCUSUA511WRP0	Cushion	2	AC
Δ	4-27	PCUSUA329WRP0	Cushion	1	AC
Δ	4-28	PCUSUA514WRP0	Cushion	1	AB
Δ	4-29	PPACGA073WRE0	Cushion	1	AP
Δ	4-30	PCUSUA515WRP0	Cushion	1	AD
Δ	4-31	PSHEPA668WRE0	Cover	1	AK
Δ	4-32	PCLICA034WRE0	Hand clip	3	AD
Δ	4-33	PCLICA032WRE0	Hand clip	2	AD
Δ	4-34	PCUSUA173WRP0	Cushion	1	AC
Δ	4-35	PCUSUA278WRP0	Cushion	1	AB
Δ	4-36	PSHEPA673WRE0	S/Film	1	AD
Δ	4-37	PSHEPA674WRE0	Cover	1	AL

DOOR PARTS

Δ	5- 1	FDORFA322WRT0	Door panel assembly	1	AZ
Δ	5- 2	PSHEPA649WRE0	Sealer film	1	AB
Δ	5- 3	FANGKA206WRY0	Latch angle assembly	1	AW
Δ	5- 4	FCOV-A004WRK0	Door case assembly	1	BG
Δ	5-4-1	LSTPPA180WRF0	Glass stopper R	1	AK
Δ	5-4-2	LSTPPA182WRF0	Glass stopper U	1	AN
Δ	5-4-3	PGLSPA522WRE0	Front door glass	1	AQ
Δ	5-4-4	XCPD40P08000	Screw : 4mm x 8mm	6	AA
Δ	5- 5	GWAKPA580WRM0	Door handle	1	AQ
Δ	5- 6	JHNDMA040WRW0	Handle lever	1	AN
Δ	5- 7	LANGKA874WRW0	Latch lever	1	AR
Δ	5- 8	LSTPPA181WRF0	Latch head	2	AL
Δ	5- 9	MSPRTA190WRE0	Latch spring	1	AD
Δ	5-10	PCUSUA506WRP0	Cushion	1	AC
Δ	5-11	XCPD40P06000	Screw : 4mm x 6mm	1	AA
Δ	5-12	LSUB-A083WRE0	Sealed plate A	2	AF
Δ	5-13	LSUB-A084WRE0	Sealed plate B	2	AE
Δ	5-14	LSUB-A085WRE0	Sealed plate C	2	AE
Δ	5-15	PCUSUA505WRP0	Cushion	1	AC
Δ	5-16	XCPD40P08000	Screw : 4mm x 8mm	4	AA
Δ	5-17	GCOVHA395WRF0	Choke cover	1	AK
Δ	5-18	HBDGCA087WRE0	Door badge	1	AG

Note: The parts marked "Δ" may cause undue microwave exposure.
The parts marked "*" are used in voltage more than 250V.

REF. NO.	PART NO.	DESCRIPTION	Q'TY	CODE
5-19	XEPSD40P25K00	Screw : 4mm x 25mm	2	AB
5-20	PCUSUA508WRP0	Cushion	1	AC
5-21	PCUSGA514WRP0	Cushion	1	AG

MISCELLANEOUS

6- 1	TINSEA781WRR0	Instruction book	1	AQ
6- 2	FW-VZB719WRE0	Main wire harness	1	AY
6- 3	PZETEA076WRE0	Switch insulator	1	AC
6- 4	TCAUHA214WRR0	K caution label	1	AC
6- 5	TSPCNC700WRR0	Rating label	1	AE
6- 6	TLABMA585WRR0	Menu sticker	1	AG
6- 7	TCAUAA249WRR0	Caution label	1	AE

"SCREWS,NUTS AND WASHERS

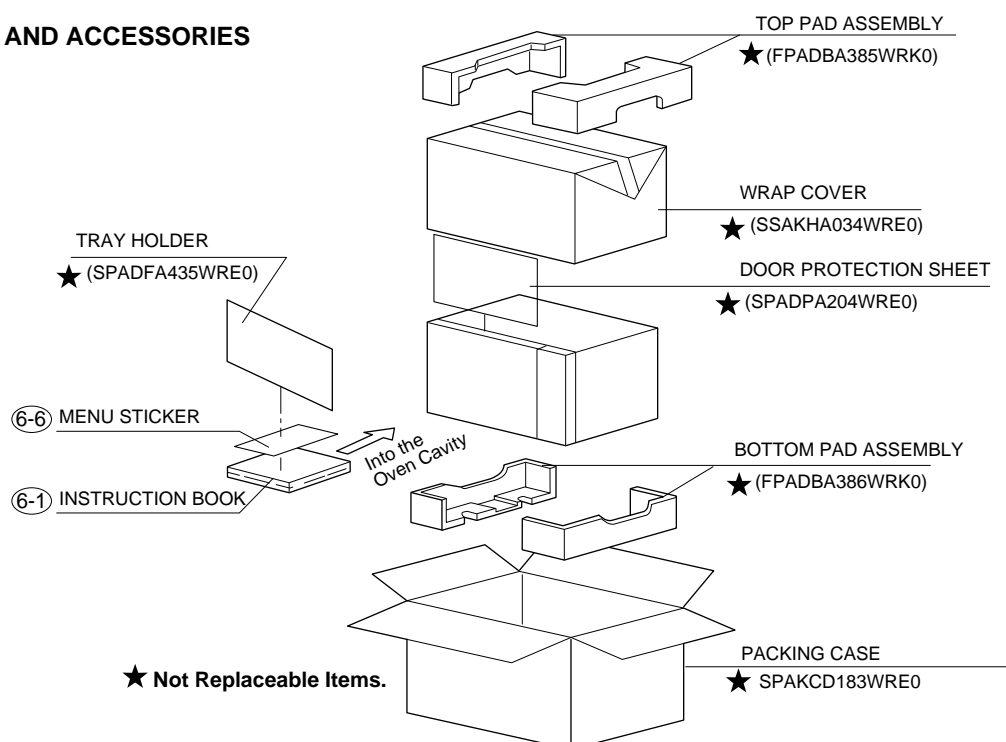
7- 1	XHPSD40P08K00	Screw : 4mm x 8mm	9	AA
7- 2	XEPSD40P25000	Screw : 4mm x 25mm	2	AA
7- 3	XOTSD40P12RV0	Screw : 4mm x 12mm	12	AA
7- 4	LX-CZA052WRE0	Special screw	2	AA
7- 5	LX-EZA042WRE0	Special screw	2	AB
7- 6	XBPPW40P04000	Screw : 4mm x 4mm	1	AB
7- 7	XFPDSD40P08000	Screw : 4mm x 8mm	1	AA
7- 8	XBPSD30P28KS0	Screw : 3mm x 28mm	1	AA
7- 9	XHPSD30P08000	Screw : 3mm x 8mm	1	AA
7-10	XHTSD40P08RV0	Screw : 4mm x 8mm	4	AA
7-11	XOTSD40P12000	Screw : 4mm x 12mm	2	AA
7-12	XOTSE40P08000	Screw : 4mm x 8mm	1	AA
7-13	XOTWW40P10000	Screw : 4mm x 10mm	4	AA
7-14	XNESD30-24000	Nut : 3mm x 2.4mm	1	AA

HOW TO ORDER REPLACEMENT PARTS

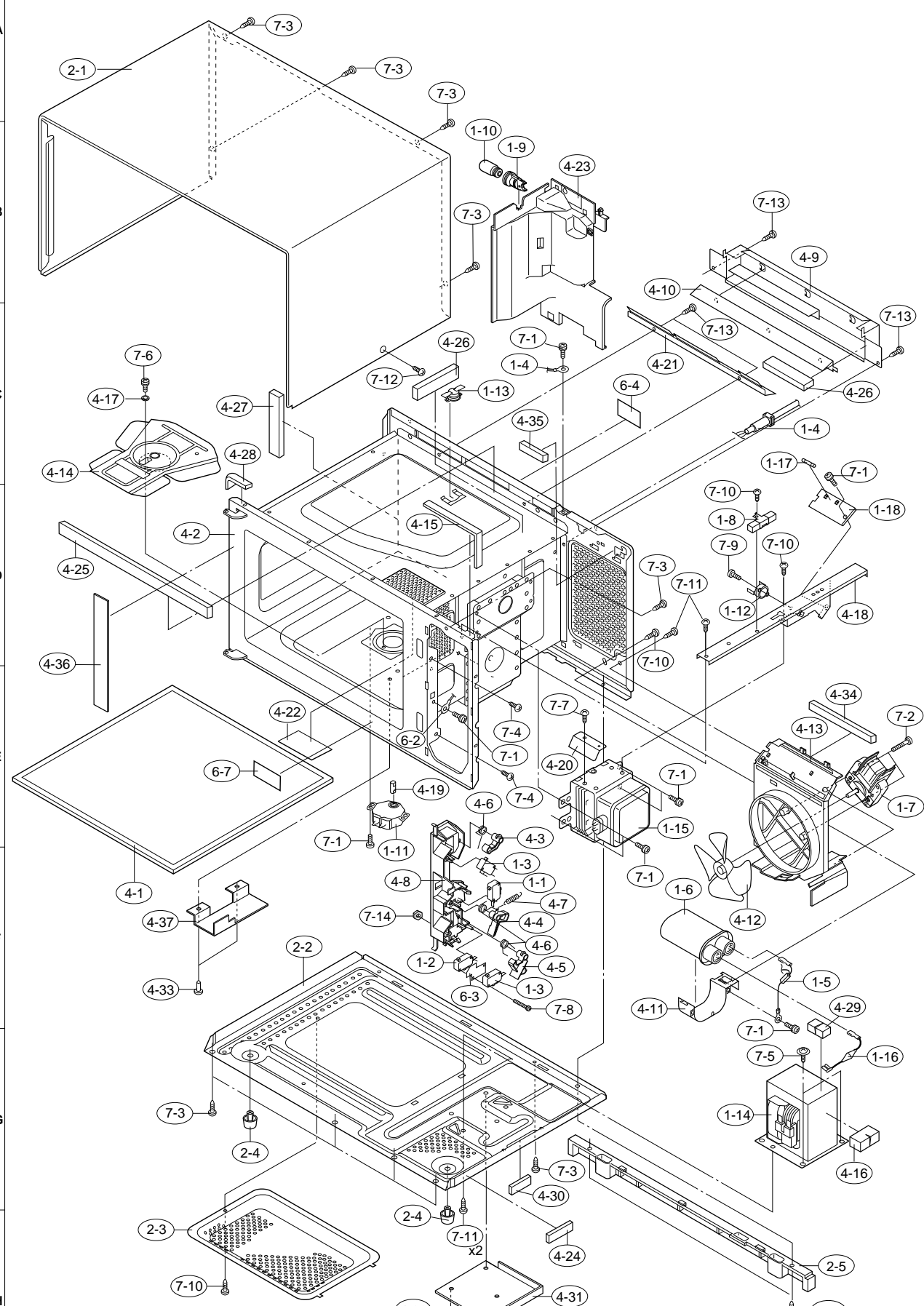
To have your order filled promptly and correctly, please furnish the following information.

1. MODEL NUMBER 2. REF. NO. 3. PART NO. 4. DESCRIPTION

PACKING AND ACCESSORIES



OVEN AND CABINET PARTS



CONTROL PANEL PARTS

DOOR PARTS

MISCELLANEOUS

Actual wire harness may be different from illustration.